November 18, 1946

STEEL

The Magazine of Metalworking and Metalproducing

TECHNOLOGY DEPT!

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 45

VALLEY MOULD & IRON CORP.

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Factory-wired, conveniently packaged Reliance V★S Drive provides unlimited range of adjustable speeds for Diesel locomotive axle grinder.

Whatever your product, whatever the machines used in making it, Reliance V★S Drive can increase the speed of production — and reduce your costs at the same time. V★S, the *All-electric, Adjustable-speed Drive operating from A-c. Circuits,* has done just this in many thousands of diversified applications.

On-the-spot conversion of A-c. power by the V★S Drive offers you unlimited flexibility of operation through automatic or manual control, either at the machine or from remote stations. Specifically, this means lightning starts and stops, stepless speed changes, maintenance of proper tension, reversal at any desired point, plus your choice of other specialized functions. For more details of V★S operation, return coupon below today!

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"Motor-Drive is More Than Power"

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Please send your Bulletin 311 describing the operation and advantages of the Reliance V★S Drive.

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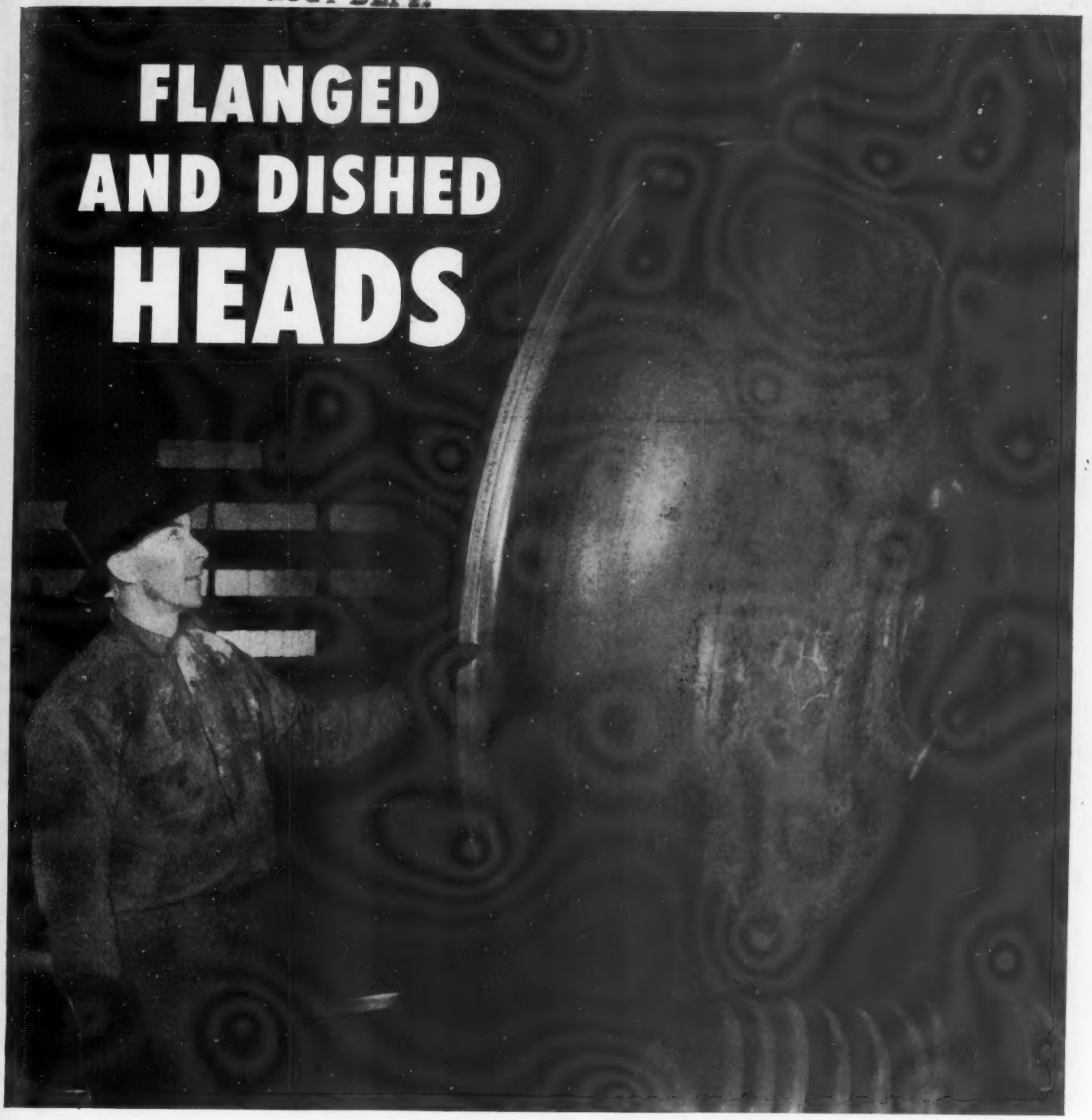
FLANGED AND DISHED HEADS



Using spinning or pressing operations, Bethlehem turns out a complete line of flanged-only and flanged-and-dished heads. Diameters range from 10 in. to 144 in.—thicknesses from ⅛ in. to 4 in. Larger diameters can be produced for special requirements.

Some Bethlehem heads are formed hot, then gradually cooled at shop temperature to minimize internal strains and stresses. Others are pressed cold. Regardless of method, you can always count on Bethlehem heads for smooth, regular contours, and freedom from wrinkles and buckles.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Flanged-and-Dished Products Made by Bethlehem

HEADS

Flanged-Only — Standard Flanged-and-Dished
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ASME Code Flanged-and-Dished
Elliptical — Tank-Car

★ ★ ★

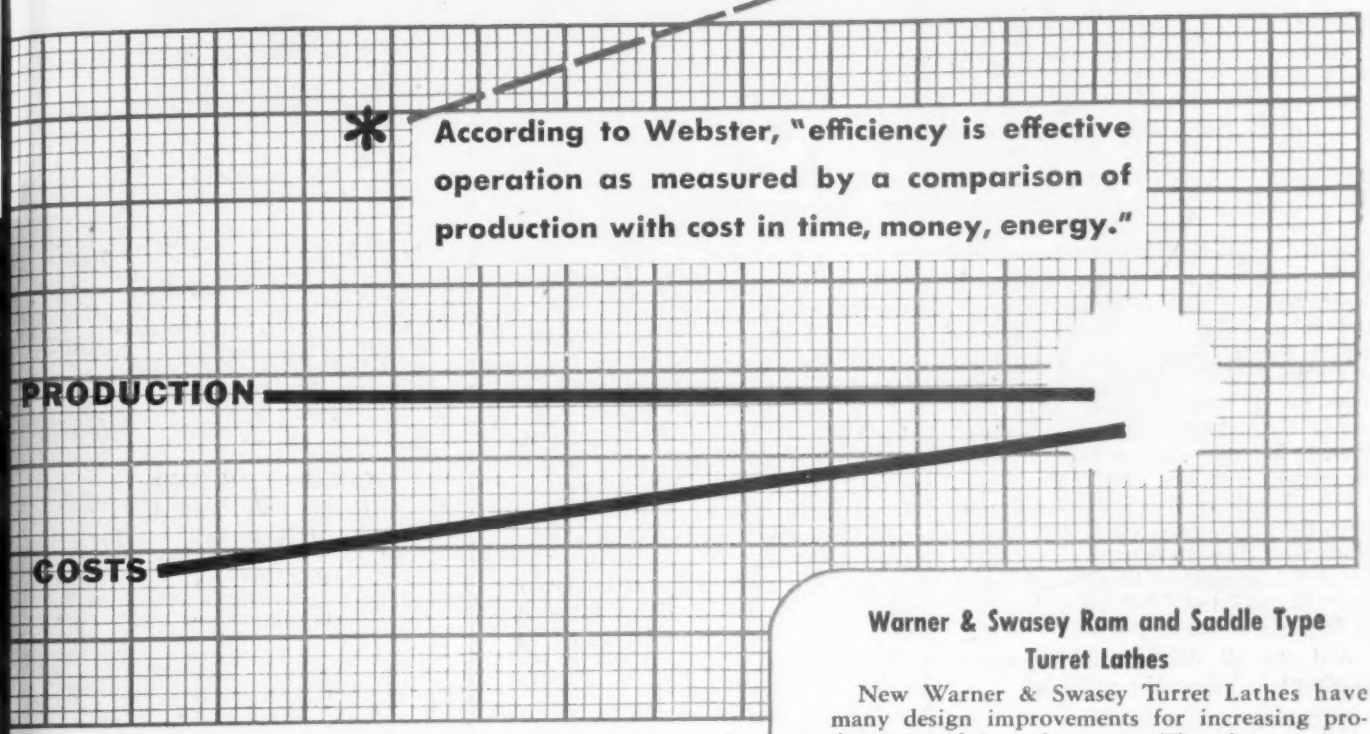
Standard Manholes and Covers — Hand Holes and Covers
Flue Holes — Collar Flanges — Pipe Flanges

★ ★ BETHLEHEM STEEL ★ ★

When does a machine tool

TURRET LATHES, MULTIPLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES

lose its *Efficiency?**


* According to Webster, "efficiency is effective operation as measured by a comparison of production with cost in time, money, energy."
PRODUCTION
COSTS

ARE YOUR SHOP COSTS RISING FASTER THAN YOUR PRODUCTION?

IF YOUR PRODUCTION CURVE is not keeping pace with advancing costs and an increasing number of orders, perhaps the whole trouble can be found in machine tools which have lost their efficiency even though they produce as much as ever.

For measurement of efficiency is not static; rising labor and material costs and a need for faster production to satisfy greater demands have advanced the retirement age of many machines.

Warner & Swasey field engineers are skilled in analyzing production needs from a machine tool standpoint. Perhaps one of them can find ways of stepping up the productivity of your present machines through new tools or accessories, or, if replacement is necessary, he can advise you on the right type or model.

For peak machine tool efficiency—choose a Warner & Swasey.

Warner & Swasey Ram and Saddle Type Turret Lathes

New Warner & Swasey Turret Lathes have many design improvements for increasing production and lowering costs. They have greater power for taking heavier combined cuts at higher speeds. Their rigidity holds extreme precision on large chucking operations as well as on small work pieces to minimize scrap loss.

Warner & Swasey Multiple Spindle Automatics

With the new Warner & Swasey Bar and Chucking Automatics, small and medium lots as well as long runs are both practical and profitable. A patented Quick-Set mechanism eliminates cam changes, speeds and simplifies changing to new setups.

Warner & Swasey Precision Tapping and Threading Machines

The new and radically different leading-on principle of Warner & Swasey Tapping and Threading Machines insures faster production of class 3, 4 and 5 gage fits. An automatic clutch reduces tap breakage. Scrap losses due to thread errors are practically eliminated.

WARNER & SWASEY
Machine Tools
Cleveland

You Can Machine it Better, Faster, for Less... with a Warner & Swasey

Behind the Scenes . . .

Toasting Tasteful Toast

This tale comes to us from the Associated Industries of Massachusetts, and it has to do with the efforts of American Army people to get Japanese firms to build automatic electric toasters. Seems that one of these gadgets was shown to a Jap firm, with the instructions that they supply specifications for a similar device which could be manufactured for Army use. After a short lapse of time, the Japs came back with specifications, from which we have extracted the paragraph entitled, "Method of Use", and it goes like this: Firstly, please remove the timelever which is in front of the base, to the engraved line which show minute you desire to toast, and remove the switchlever, under the timelever, to left from right so that the electric current will flow. Next, please put in the bread to the mount, and put down the right handle (against to face). When the time you prefer to toast elapse, the electric current will be cut off automatically, and tasteful toast will spring up from the mouth of the box.

And it's all due to the automatic watchswitch, adjustable willingly!

It Was Boiled But Vile

To aid their study of bird migration, the Washington Biological Survey put metal bands around the legs of captured birds and then released them. The inscription on the band read, "Wash. Biol. Surv." The *Wolf Magazine of Letters* reports that a Canadian farmer shot down a crow thus banded, then sat down and wrote this indignant letter:

"U. S. Government

Dear Sirs:

"I shot down one of your pet crows the other day and following instructions attached to it, I washed it and biled it and surved it. It was turrible. You should stop trying to fool the people with things like this. . ."

Sometimes, we feel, it pays to question things one reads.

Hot Stuff Coming Up

These days we have a hot subject on our hands, and this time we aren't kidding. It's one of the hottest we've touched in many a long day. Has to do with hotter heat in melting furnaces, including open hearths and blast furnaces. Secret of the new development seems to be somewhat of a giant application of the supercharger principle. John Knox, our steel plant editor, has dug up some information on the subject and there will be on December 2 a follow-up of the first mention, which appeared in our engineering section Nov. 11, of the use of excess oxygen to speed up open hearth melting time. Now if you were able to wander through the confused syntax of that last sentence, we think you must be interested in the subject, and so we can go on to say that this is the latest news to be published on this hottest of steelmaking developments.

Cheep, Cheep!

Up in Boston, reports L. E. Browne, our New England editor, there was a rich old geezer whose only prospective heir was a nephew whose means never reached to his ends, and who was always hoping for a small advance on the fortune one day to be his. The opulent uncle, however, was a stingy old soul whose efforts seemed to be aimed at taking it all with him. A friend of the family one day pointed out to the old boy that his nephew was about to be married, and that it would be nice for the old man to do something for the boy. After thinking it over seriously, the uncle said, "You're right. I should do something for him. And I know exactly what, too. I'll pretend that I'm dangerously ill!"

The Iron Horse, Maybe?

From one of our good readers comes a constructive suggestion. Seeing in this space a couple of issues back a short item about scientists locating a new source of copper in cows, he suggests that this is most gratifying information, and couldn't we please have the scientists try some other animals with the idea of locating for him a source of steel. Maybe he has something there. And besides, some geologists tell us that most of the iron mines of the Minnesota and Michigan ranges had their origin in small animals who lived in the mud at the bottom of prehistoric lakes and seas, so maybe they have some descendants, who knows?

Or could be that this November sunshine has affected our thinking powers.

Shrdlu

(Editorial Index—45)

STEEL

Vol. 119—No. 21 November 18, 1946

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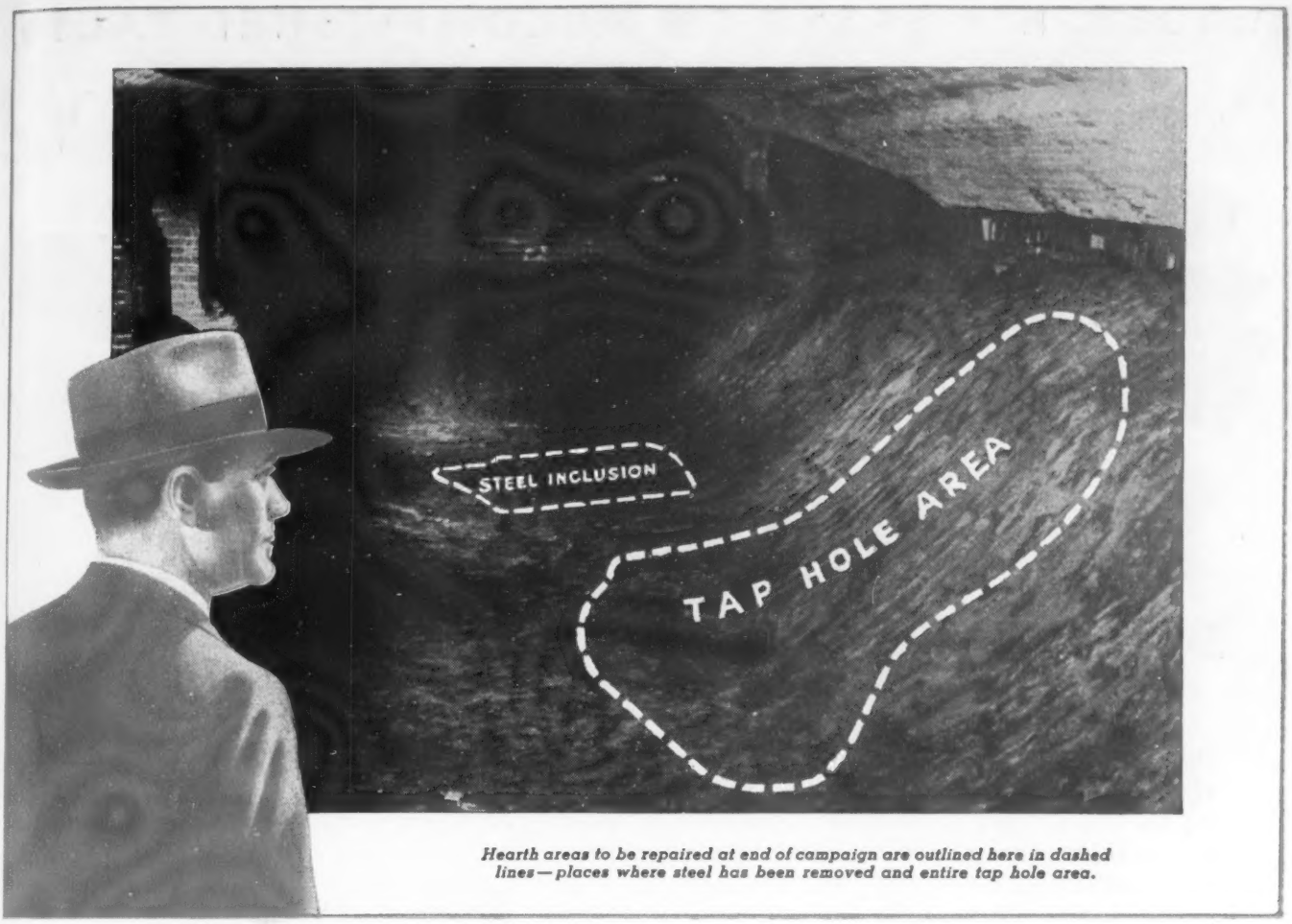
Editorial Staff on Contents Page



Hearth areas to be repaired at end of campaign are outlined here in dashed lines—places where steel has been removed and entire tap hole area.

TAKE TIME TO SAVE TIME ON BOTTOM REPAIR

A MIDWEST steel plant has an enviable record of low cost steel production. Reduction in bottom delay time is in large measure responsible for the economy in open hearth operation through periods of slack and of peak production.

The practice in this shop is to wash down the hearth prior to taking a furnace off at the end of a campaign. Air is used to cleanse the banks and bottom of lime and dolomite accumulation.

While roof repair and other rebuilding are in progress, banks and bottoms are examined and any steel inclusion dug out. The entire tap hole section is removed from the flat to the slag line and for a distance of about three feet on either side of the tap hole. Ramix is used to rebuild the tap hole and hearth sections which have been removed.

After the rebuilt furnace is brought up to temperature, the hearth is dressed with Magnefer to obtain the desired contour. The Magnefer sets rapidly to provide a sound, dense working surface for the new furnace campaign. The time required to resurface with Magnefer, no more than 8 to 10 hours, is quickly made up by the reduction in time down for bottom repairs.

Basic Sales Engineers are at your service to assist you in setting up similar hearth maintenance programs and to help in solving other basic refractory problems.

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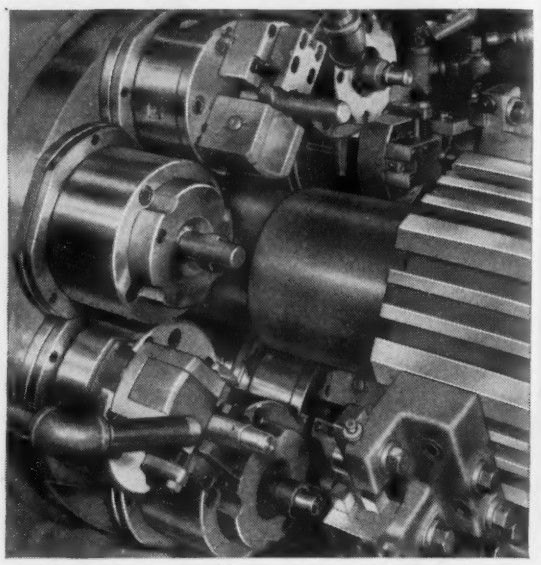
LEADERSHIP BASED ON ACCOMPLISHED FACTS

8 SPINDLE ACCURACY IN FULL Swing

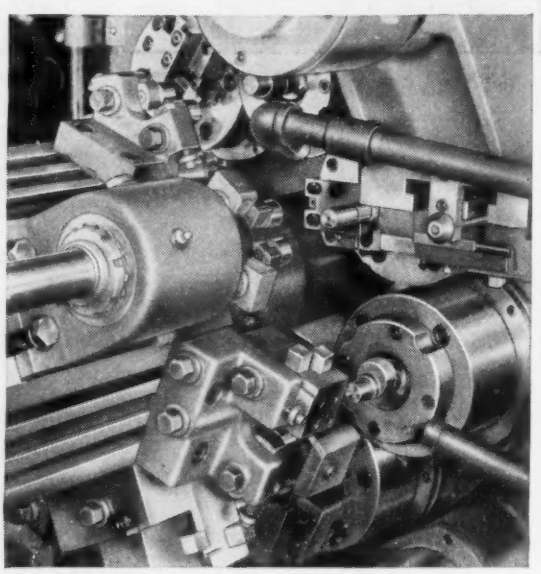
The piece shown above is a good illustration of the versatility of the New Britain Model 86 Eight Spindle Automatic Chucking Machine. By using double index on the Model 86, four spindles are used for one end of the crank shaft and the other four spindles used for the other end. Thus each time the machine indexes, it delivers a finished part.

Very important, too, is the maintenance of close diameter limits of both ends and holding the limits between the shoulders of the eccentric. This calls for a remarkable degree of precision in locating the shaft during the second operation . . . a severe test of the accuracy of the spindles and the carrier locating and locking mechanism.

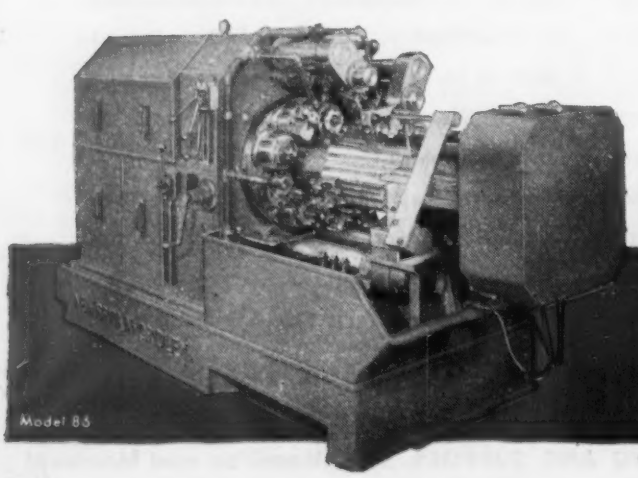
Production figures prove the ability of the machine to meet these testing requirements: The fifteen necessary operations are performed in 19 seconds. The gross production is 190 pieces per hour, with accuracy maintained well within the specified tolerances. Your work may or may not be similar to this particular job. One thing is sure . . . if it involves high production, and you want low cost per piece, the New Britain representative in your locality is the man to see.



FRONT VIEW—Entirely open end construction provides accessibility for simplified chucking, cutting tool and attachment setup.



REAR VIEW—Wide open end construction provides extra large chip... space accessibility from three sides and from above that permits excellent visibility and easy tool adjustment.



NEW BRITAIN AUTOMATICS

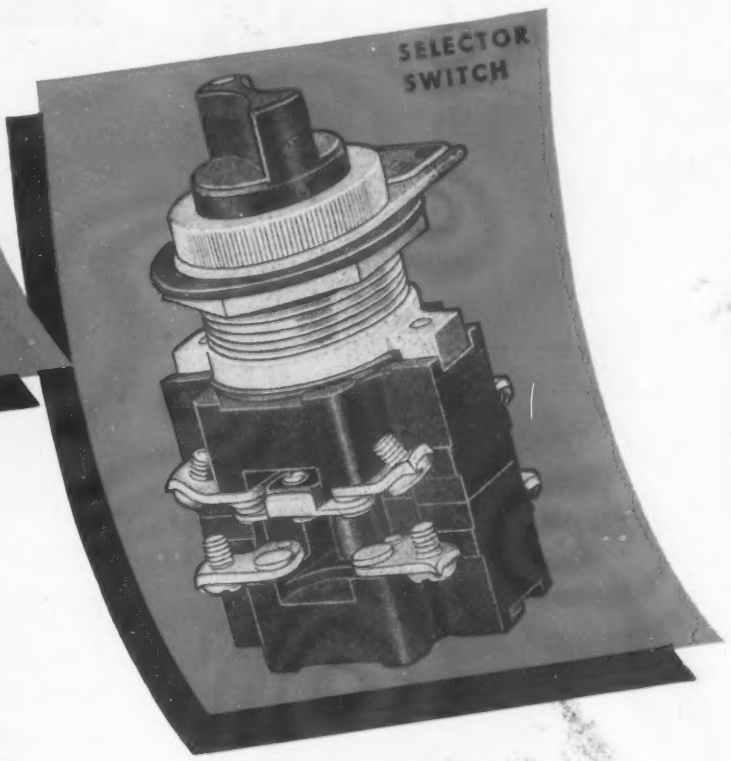
THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN, CONNECTICUT
NEW BRITAIN-GRIDLEY MACHINE DIVISION

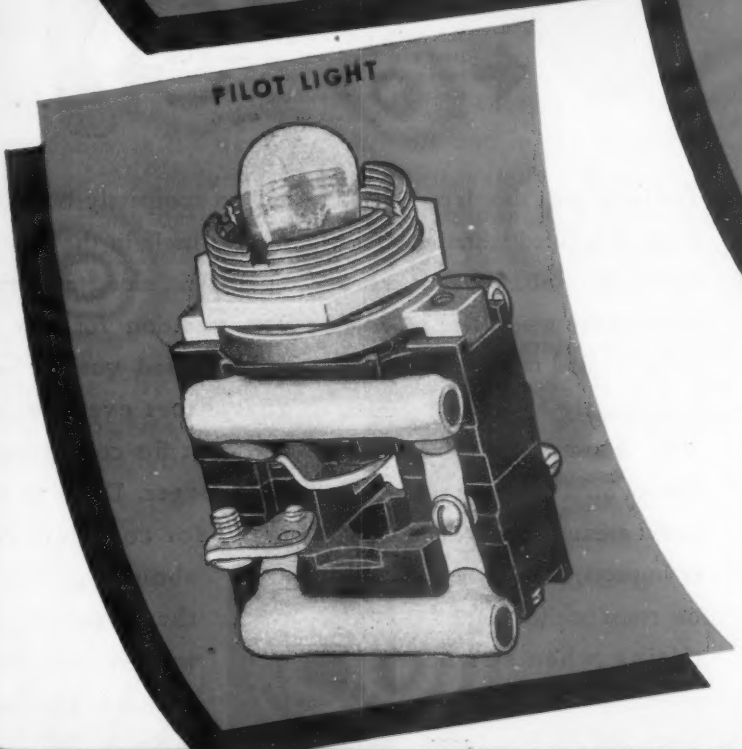
M-01043

Another "3C" Achievement!

PERMANENTLY OIL TIGHT PUSH BUTTON, PILOT LIGHTS *and* SELECTOR SWITCHES *for use on Machine Tools*

Now you can avoid fouling contacts from seepage of oil or cutting compounds with these new "3C" developed Push Button Elements, Pilot Lights and Selector Switches that are *entirely oil tight.* A steel faced oil-tight washer is held snugly against both front and rear of the panel by close fitting nuts. An oil-tight boot closely grips the button, effectively sealing it against leakage.





These heavy-duty Type DO units have the same basic elements as the "3C" Type "D" units which have established such excellent records in heavy-duty use. Push Buttons and Selector Switches feature Silver-to-Silver Double Break Contacts. All units have large, easily accessible terminals that simplify wiring. Selector Switch permits 2 or 3 position operation. Vertical mounting is standard, but all units are adaptable to horizontal mounting. Mushroom head available for Push Button. Color caps for Pilot Lights are available in Red, Green, Amber, Blue, Clear and White.

Write for full information.

THE CLARK CONTROLLER CO.

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Don't leave it to chance

IN CHUCK-A-LUCK — the odds are 215 to 1 against three of a kind; 13.4 to 1 against two of a kind. Paying even money on the singles, two-for-one on the doubles, and three-for-one on triples, Chuck-A-Luck always gives a 7 47/54 percentage in favor of the "house".

LEAVE IT TO—

HY-TEST

THE SAFETY SHOE WITH THE

ANCHOR FLANGE

STEEL BOX TOE

This flange adds extra strength to the steel arch's sidewall. Anchored between insole and outsole, it also serves to resist shifting and tilting when toe is struck at an angle.

The latest style shoe is completely old-fashioned when worn on hazardous jobs. Today more workers are wise to the ways of safety . . . and more workers are wearing Hy-Test Safety Shoes. They know Hy-Test's Anchor-Flange Steel Box Toe stands up under greater pressure and harder impacts..."stays put" to resist shifting and tilting when struck glancing blows. Yet this Steel Box Toe is so light and so compactly built-in th it loses itself in the shoe's ne lines. This, along with the H Test tradition for fine wor manship and quality leathe guarantees every wearer shoe that fits comfortably a lasts longer. Drop us a ca today for complete detai about a simple pl that provides yo workers with the pr tection of Hy-Test Sa ty Shoes.

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THE WORLD'S LARGEST SELLING SAFETY SHO

HY-TEST *Safety Shoes*

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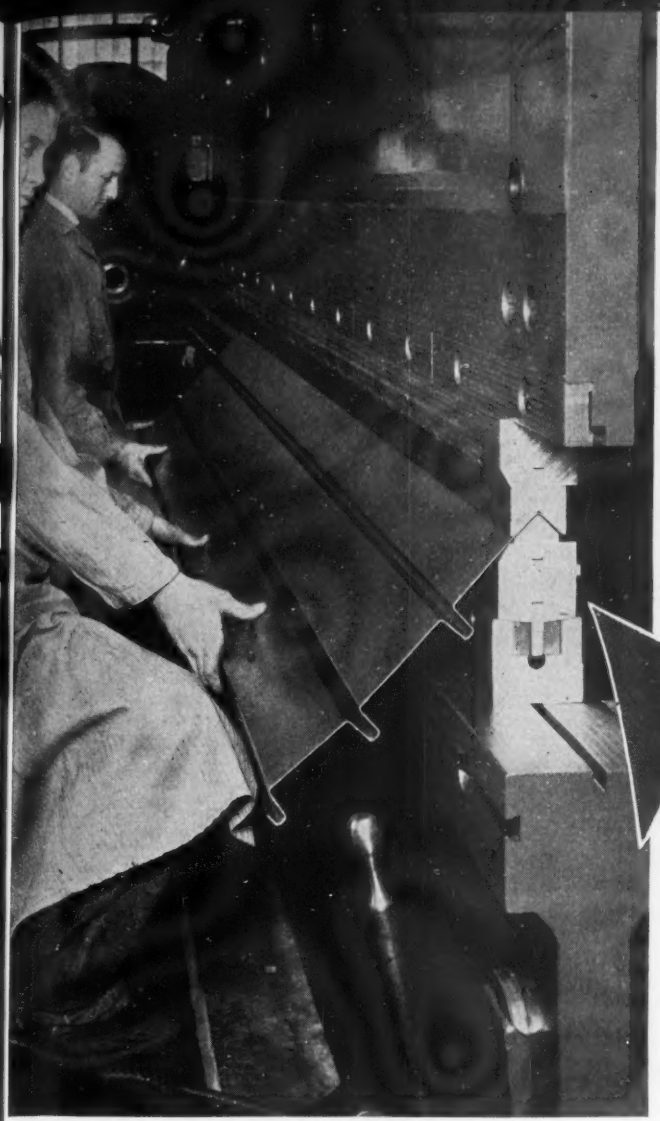
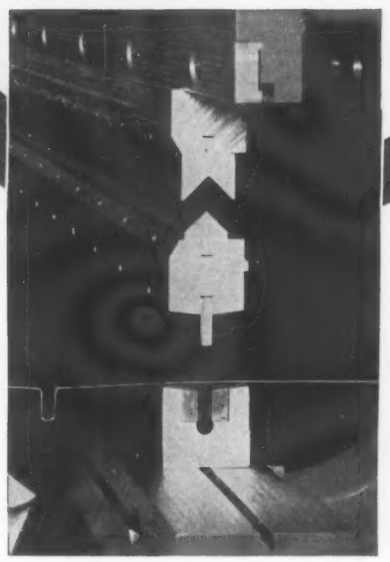
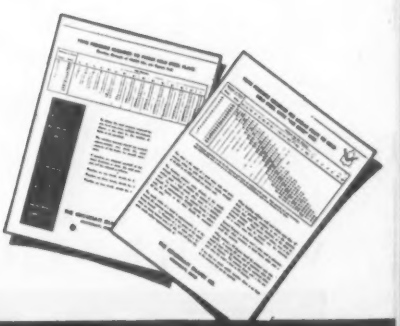


What Pressure here?



This was an unusual job. There were unusual and exacting problems in the design of the die and in the determination of the pressure. However, Cincinnati Engineering successfully designed the dies, determined pressures and recommended a Cincinnati Series 120 Press Brake for the job.

Since the pressures needed even in simple bends are governed by a number of factors, we suggest you ask the experienced Cincinnati Engineering Department for advice on your particular forming problems.



Write for Pressure Chart 5-M

This chart may be useful to you as a general guide on the pressures required on your forming jobs.

THE CINCINNATI SHAPER CO.

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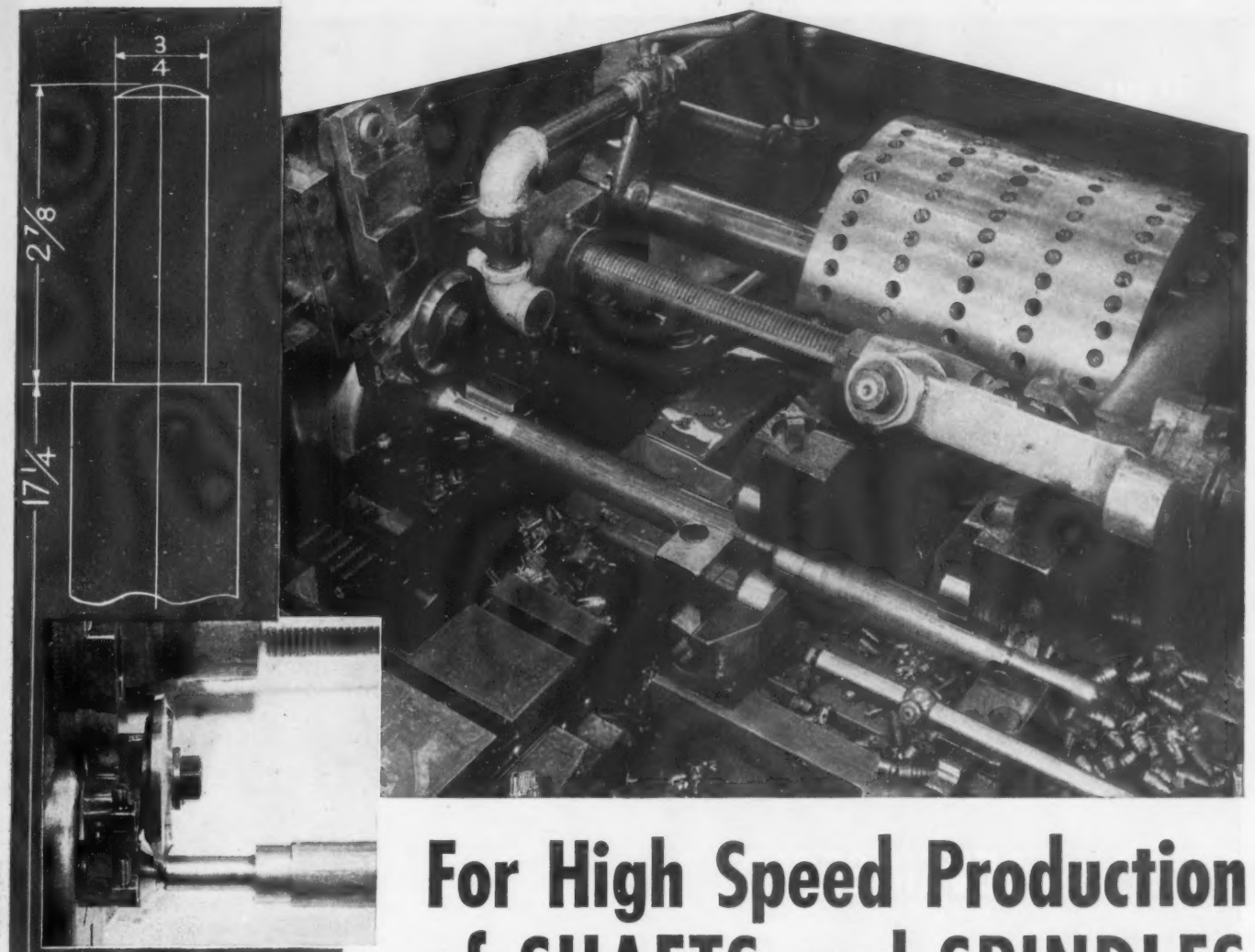
are blended the care of our metallurgists and chemists, the planning of our production men, the sweat of our many skilled workers . . . all working together for just one thing . . . to make sure that when our product becomes part of your product, it will give you exceptional performance.

WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS–STRIP–RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES



For High Speed Production of SHAFTS and SPINDLES

● This 22 5/16" shaft, produced from 1 3/8" 1020 cold rolled steel bar at the rate of 25 per hour on a Cleveland Automatic, offers a typical demonstration of the productive usefulness of the B type combination of automatic milling slide and double cross slide.

The machine is a Cleveland Model B 1½" x 18". Handling of the shaft and its fast production are accomplished with the following simple set-up. On the milling slide, a three-roller steady rest is located for the stock diameter (1 3/8") and a combination tool turns and steadies the ¾" thread diameter. The rear cross slide forms the ⅝" thread diameter, including radius. The front cross slide forms the 1.249 diameter to size, both cross slides completing their work during the turning time. The independent cut-off, with a circular cut-off tool, is set to cut off and radius the back end of the shaft and radius the front of the incoming piece simultaneously.

Just another example of day in and day out cost cutting with Clevelands. Let us propose cost cuts for YOUR production.

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"When you want this valve to work . . . it works"

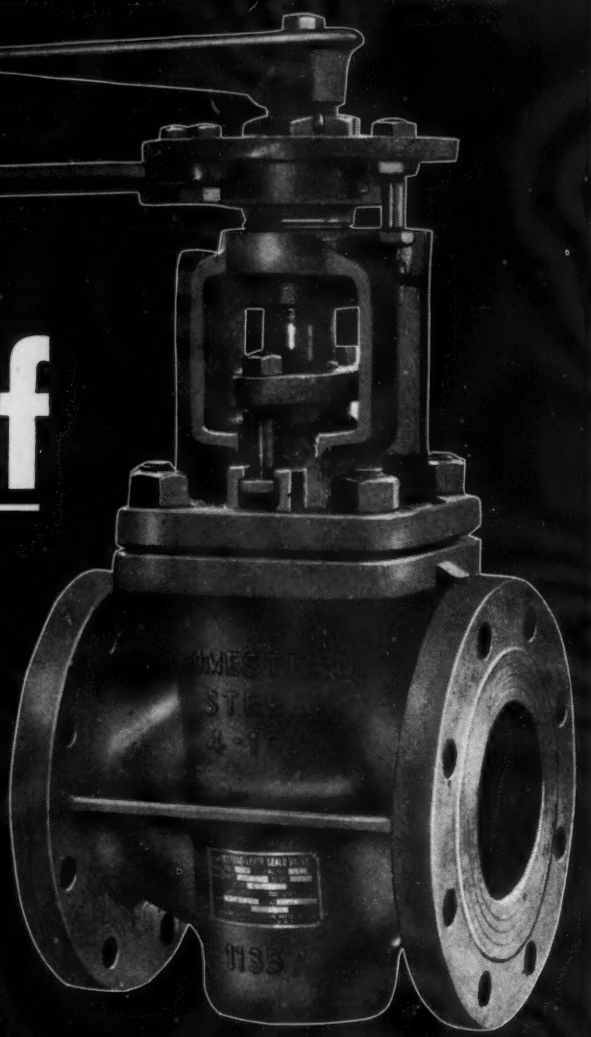
it's

Stick-Proof

because

it's

LEVER-SEALD



HOMESTEAD LEVER-SEALD VALVES operate *instantly* with only a *Quarter-Turn* . . . at all times and under all conditions . . . in services where extremes of temperature, pressure, or the corrosive action of line fluids would cause ordinary valves to stick or "seize."

That's why they have been favorites with industry for more than 15 years in all sorts of difficult applications.

They're *stick-proof*, because built right into each valve is a powerful lever and screw device that *relieves seating pressure* between plug and body just enough to overcome friction and permit *easy turning*.

This *stick-proof* construction is only one of many HOMESTEAD LEVER-SEALD VALVE features assuring long, economical, trouble-free service.

You may order HOMESTEAD LEVER-SEALD VALVES in metals and alloys to meet service requirements, in sizes from 1½" to 12" with regular or wedge gate valve face to face dimensions, for pressures from vacuum to 1500 pounds. Complete technical details and Valve Reference Book No. 38 are yours for the asking.

CHECK THESE OUTSTANDING LEVER-SEALD VALVE FEATURES

1. Instant stick-proof operation.
2. Quarter-turn fully opens or closes.
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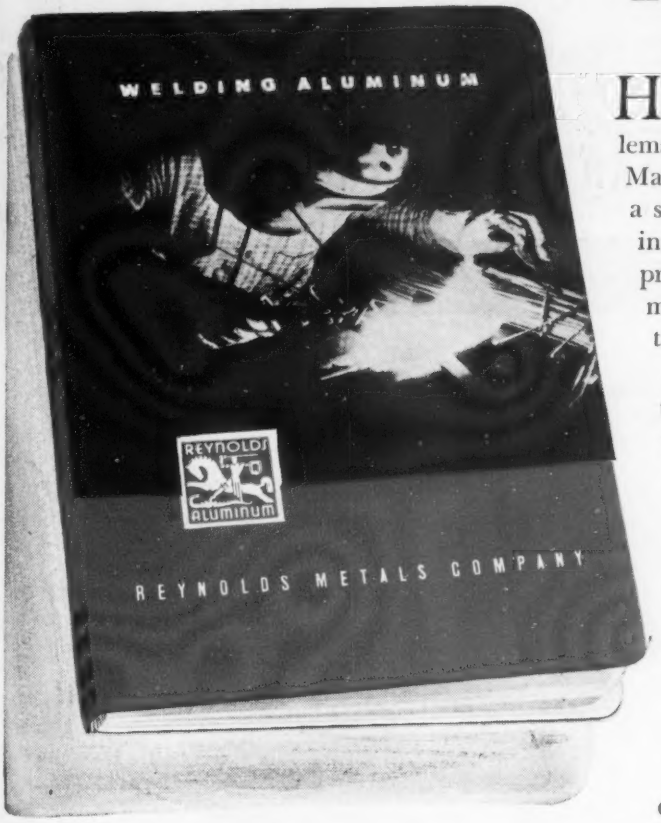
New! A Handbook on Welding Aluminum

Are you welding aluminum now? Do you plan to weld aluminum in the future? If so, this book is for you!



HERE's a new up-to-the-minute book, "Welding Aluminum," that presents a concise, authoritative discussion of problems dealing with welding aluminum and aluminum alloys. Many new war-developed applications are described. Under a single cover, in handy usable form, you will find detailed information on 11 aluminum welding processes, from edge preparation to finishing, a comprehensive discussion of aluminum alloys and tempers, and helpful tables on properties, gauges, sizes, and strengths.

"Welding Aluminum" is clearly illustrated with 44 interesting photographs and graphs of welding operations. If you work with aluminum, you'll find "Welding Aluminum", prepared by the technical staff of the Reynolds Metals Company, an invaluable reference book.

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- Carbon-Arc Welding
- Atomic-Hydrogen Arc Welding
- Inert-Gas-Shielded Welding

RESISTANCE WELDING
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- Flash Welding

BRAZING ALUMINUM
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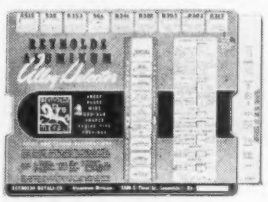

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Just two settings to place at your fingertips the mechanical properties, chemical composition, physical constants, thermal treatments, and specification numbers of *18 aluminum alloys*. Price $1.00. (Check space in coupon.)

METALS WEIGHT CALCULATOR

One of the handiest calculating devices ever developed . . . simple . . . accurate . . . fast. Calculates weights of aluminum, magnesium, steel, brass, copper, and nickel. Only $.50. (Check space in coupon.)

Reynolds Metals Company
2520 South Third Street
Louisville 1, Kentucky

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Please send me "Welding Aluminum." I enclose $1.00 (check or money order) to cover the cost of printing and mailing.

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TITLE_____

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CITY_____ ZONE_____ STATE_____

( ) Please send me a Reynolds Aluminum Alloy Selector. I enclose $1.00.

( ) Please send me a Reynolds Weight Calculator. I enclose 50 cents.

PLEASE PRINT OR TYPE CAREFULLY

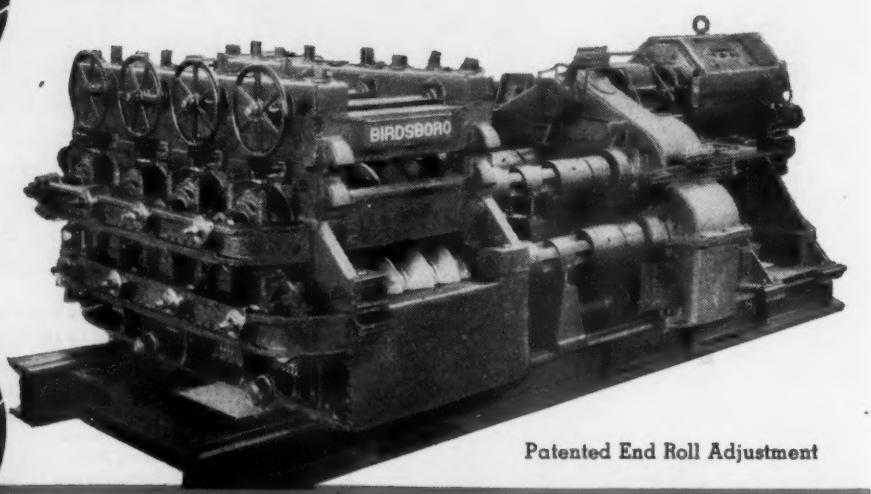
FASTER, MORE ACCURATE *Straightening*

ON ANY OF THESE

BIRDSBORO

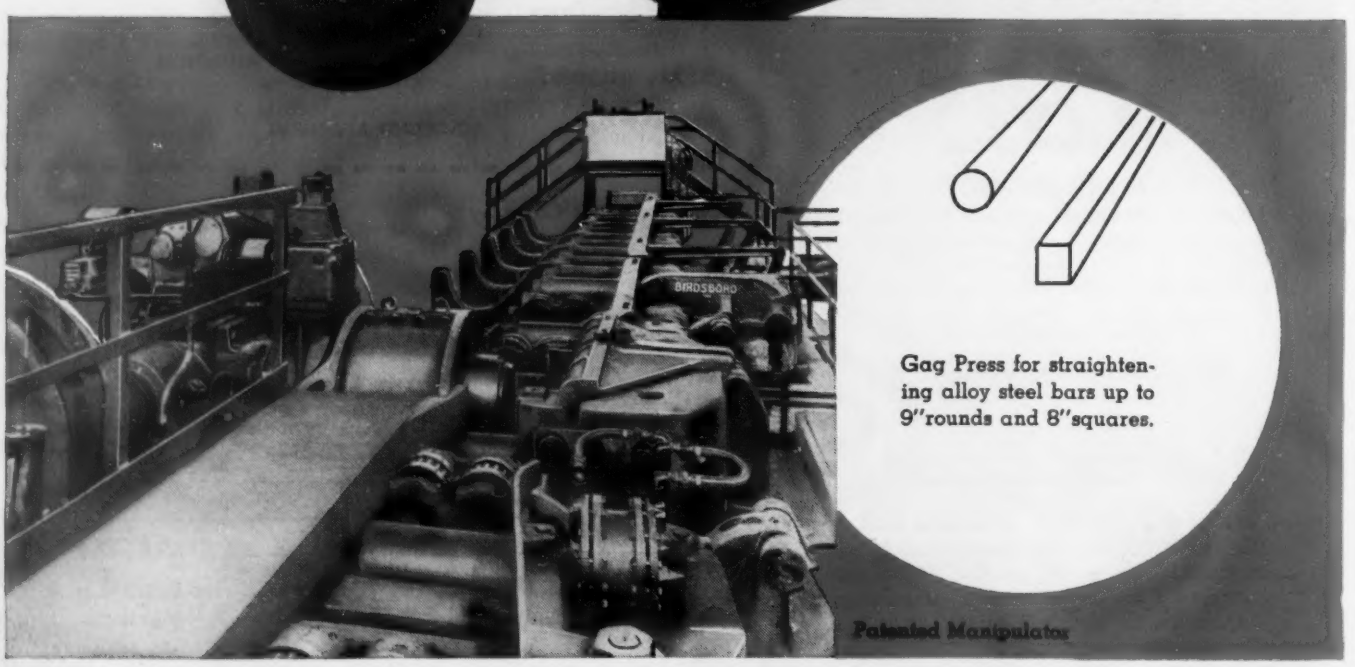
STRAIGHTENING MACHINES

Rail Straightening Press having capacity for straightening 150 lb. rails.



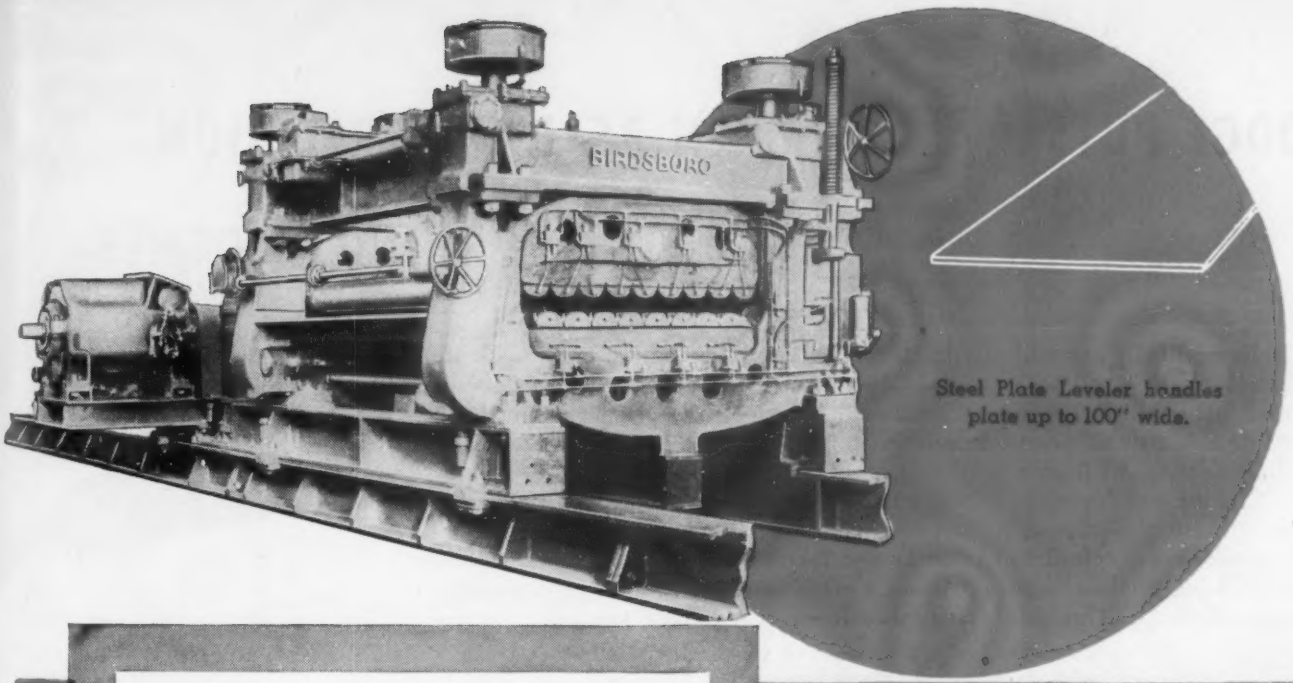
Structural Shape Straightening Machine with capacity up to 6" x 6" angles.

Patented End Roll Adjustment



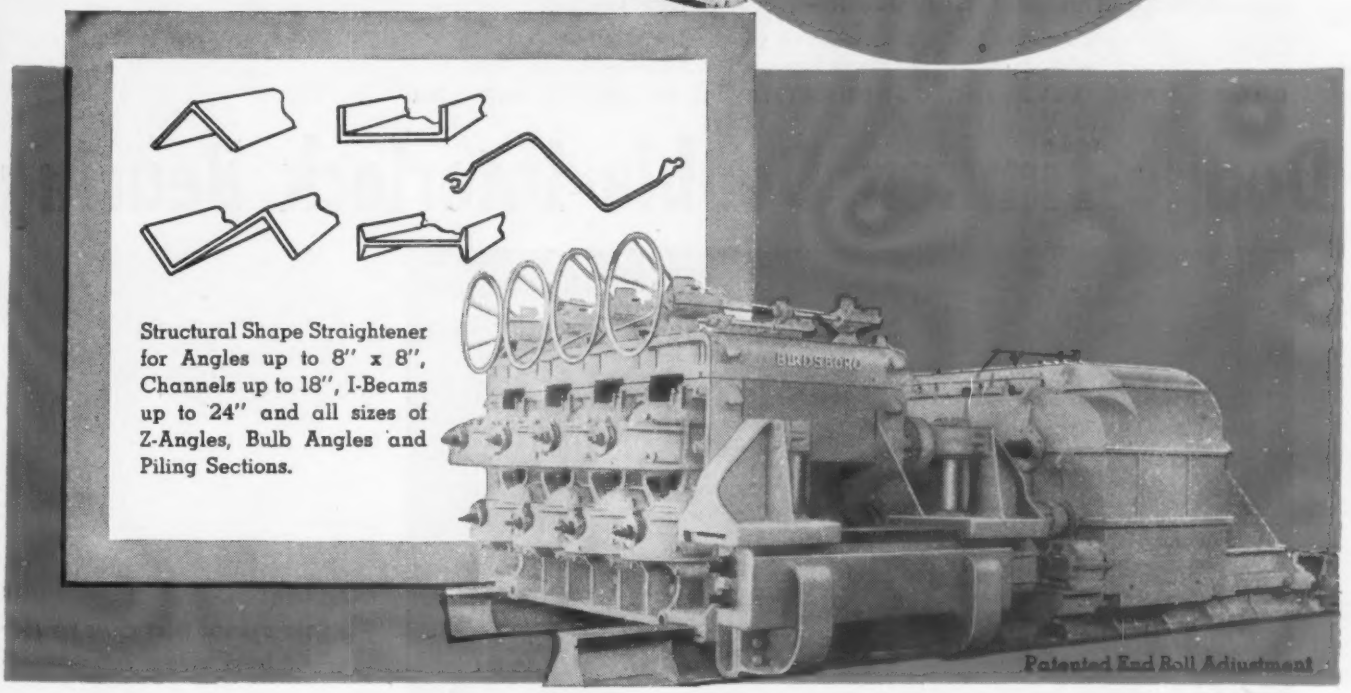
Gag Press for straightening alloy steel bars up to 9"rounds and 8"squares.

Patented Manipulator



Steel Plate Leveler handles plate up to 100" wide.

Structural Shape Straightener for Angles up to 8" x 8", Channels up to 18", I-Beams up to 24" and all sizes of Z-Angles, Bulb Angles and Piling Sections.



Patented End Roll Adjustment

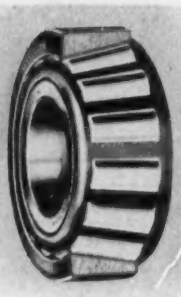
These five versatile Birdsboro Machines meet the major straightening needs of heavy industry. They have been designed for easy, trouble-free operation and built for rugged service . . . with recently developed features that reduce production costs.

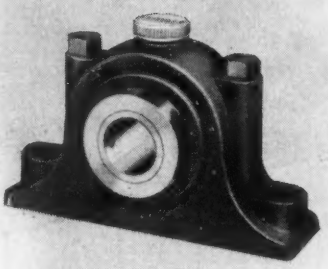
When your problem involves the straightening of any metal shapes in large or small sizes, investigate Birdsboro's facilities for producing machinery to meet your specific requirements. Our designers and engineers will welcome the opportunity to work with you to arrive at a practical solution to your problem. Get in touch with us today.

BIRDSBORO STEEL FOUNDRY & MACHINE COMPANY • BIRDSBORO, PENNSYLVANIA
Manufacturers of Steel Mill Equipment, Iron and Steel Rolls, Hydraulic Presses, Crushing Machinery, and Special Machinery

BIRDSBORO
STEEL MILL EQUIPMENT

DODGE PUTS TIMKEN BEARING PRECISION INTO WORKING CLOTHES





Delivered fully assembled, adjusted, lubricated, the Dodge-Timken Double Interlock Pillow Block is ready to lock on the shaft, run at full speed and full load. Dodge mounts, seals and houses the bearing assembly, with its double row of precision-finished rollers—makes it available for immediate service, with no assembling required on the job.

From our foundry, through many precision operations, on the latest machine tool equipment, the parts required for mounting this bearing are manufactured complete in the Dodge factory. This is one of the famous Dodge 30,000 hour line, covering a wide range of industrial bearing requirements, and promptly available from distributors' stocks.

Look for the Dodge distributor in your classified telephone directory under "Power Transmission Equipment."

DODGE MANUFACTURING CORPORATION, MISHAWAKA, INDIANA

Dodge-Timken Double-Interlock Bearing

LUBRICATION COVER CAP KEEPS DIRT OUT
STURDY, SELF-ALIGNING OUTER HOUSING
INNER HOUSING SELF-ALIGNS WITH SHAFT
NON-RUBBING INDESTRUCTIBLE LABYRINTH SEALS
SNAP RING AND SHIMS MAINTAIN CORRECT BEARING ADJUSTMENT
SET SCREWS LOCK BOTH ENDS OF RACE TO SHAFT
BEARING DELIVERED COMPLETELY ASSEMBLED, ADJUSTED, LUBRICATED—READY TO SLIP ON SHAFT AND GO TO WORK.

THE SYMBOL THAT CAME TO LIFE

413 factory graduate Transmissioneers wear this sign of a nation-wide personal service that provides the latest answers to power transmission problems.

DODGE
MISHAWAKA

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NAME PLATES

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY, ETCHING COMPANY OF AMERICA, 1520 MONTANA STREET, CHICAGO 14, ILLINOIS

IT WAS EDISON, NOT ALADDIN WHO REALLY HAD THE LAMP!

"ALADDIN'S LAMP" made good reading but gave little illumination to a light-hungry world. It was the tiny glow of Edison's incandescent lamp that expanded into the radiance which floods the globe.

Hard on the heels of Edison's invention came the need for transmitting electricity, economically, over long distances. Thus, the development of alternating current in the 1880's enabled this young nation to set the pace in the whole realm of electricity. For here was an economical means of transmitting electrical energy at high voltages and with low losses—not only for light, but also for the heat and power on which the growth of industry thrived.

Then, as now, electricity and copper were inseparable... and The American Brass Company was already a leading supplier of copper, brass and bronze. Today, with more than a hundred years of manufacturing experience behind it, this Company continues its help in working out many of the metal problems peculiar to the electrical equipment and appliance industries . . . and to the fields of electric power generation, distribution and control.

46161

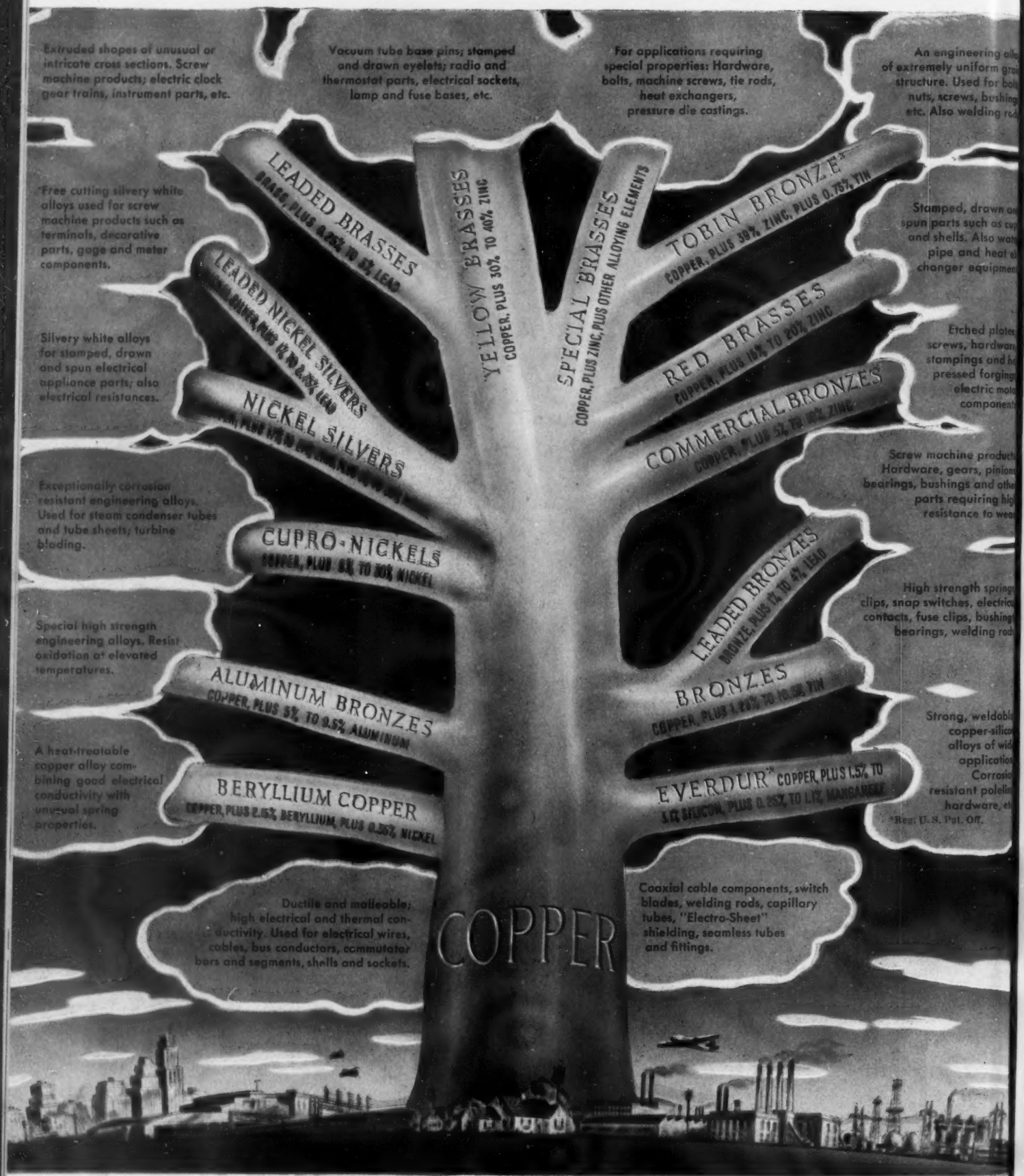
THE AMERICAN BRASS COMPANY
General Offices: Waterbury 88, Connecticut

ANACONDA from mine to consumer

Anaconda Copper & Copper Alloys

In the Electrical Industry

Nothing serves like Copper and its Alloys


Extruded shapes of unusual or intricate cross sections. Screw machine products; electric clock gear trains, instrument parts, etc.
Vacuum tube base pins; stamped and drawn eyelets; radio and thermostat parts, electrical sockets, lamp and fuse bases, etc.
For applications requiring special properties: Hardware, bolts, machine screws, tie rods, heat exchangers, pressure die castings.
An engineering alloy of extremely uniform grain structure. Used for bolts, nuts, screws, bushings, etc. Also welding rods
Free cutting silvery white alloys used for screw machine products such as terminals, decorative parts, gage and meter components.
LEADED BRASSES
BRASS, PLUS 0.25% TO 3% LEAD
YELLOW BRASSES
COPPER, PLUS 30% TO 40% ZINC
SPECIAL BRASSES
COPPER, PLUS ZINC, PLUS OTHER ALLOYING ELEMENTS
TOBIN BRONZE*
COPPER, PLUS 39% ZINC, PLUS 0.75% TIN
Stamped, drawn and spun parts such as cups and shells. Also water pipe and heat exchanger equipment
LEADED NICKEL SILVERS
Silvery white alloys for stamped, drawn and spun electrical appliance parts; also electrical resistances.
NICKEL SILVERS
RED BRASSES
COPPER, PLUS 15% TO 20% ZINC
Etched plates, screws, hardware, stampings and hot pressed forgings; electric motor components
COMMERCIAL BRONZES
COPPER, PLUS 5% TO 20% ZINC
Exceptionally corrosion resistant engineering alloys. Used for steam condenser tubes and tube sheets; turbine blading.
CUPRO-NICKELS
COPPER, PLUS 5% TO 30% NICKEL
Screw machine products. Hardware, gears, pinions, bearings, bushings and other parts requiring high resistance to wear
LEADED BRONZES
BRONZE, PLUS 1% TO 4% LEAD
Special high strength engineering alloys. Resist oxidation at elevated temperatures.
ALUMINUM BRONZES
COPPER, PLUS 5% TO 9.5% ALUMINUM
High strength springs, clips, snap switches, electrical contacts, fuse clips, bushings, bearings, welding rods
BRONZES
COPPER, PLUS 1.25% TO 10.5% TIN
A heat-treatable copper alloy combining good electrical conductivity with unusual spring properties.
BERYLLIUM COPPER
COPPER, PLUS 2.5% BERYLLIUM, PLUS 0.25% NICKEL
EVERDUR* COPPER, PLUS 1.5% TO 3.5% SILICON, PLUS 0.25% TO 1.1% MANGANESE
Strong, weldable copper-silicon alloys of wide application. Corrosion resistant poleline hardware, etc.
*Reg. U.S. Pat. Off.
Ductile and malleable; high electrical and thermal conductivity. Used for electrical wires, cables, bus conductors, commutator bars and segments, shells and sockets.
COPPER
Coaxial cable components, switch blades, welding rods, capillary tubes, "Electro-Sheet" shielding, seamless tubes and fittings.

ANACONDA
from mine to consumer

Made by THE AMERICAN BRASS COMPANY

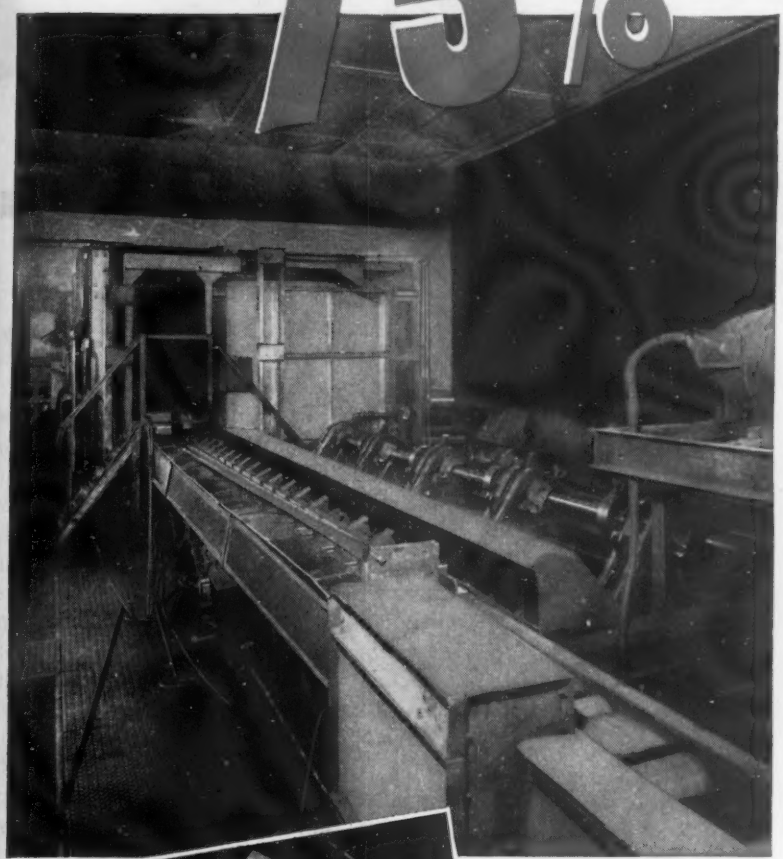
General Offices: Waterbury 88, Connecticut · Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*

3000 pounds per hour...

75% investment savings

with the Salem Continuous Rod Heat Treating Furnace



Continuous Rod Heat Treating Furnace recently designed, built, and installed by the Salem Engineering Company, builders of all types of heating furnaces and allied equipment.

When you invest company funds in a major installation like a rod heat treating furnace, you want the best equipment money can buy. And in a Salem continuous furnace, you'll have just that . . . plus substantial savings in fuel, labor costs, maintenance expense and original installation cost.

Installing a Salem furnace takes about 25% of the investment usually required by other types of heat treating furnaces. The Salem furnace heats round or square rods, carbon or alloy steel, in sizes from ½" to 3". Quenching can be done in either water or oil, and the elapsed time between furnace and quench is only 2½ seconds.

Producing at a rate of 3,000 pounds per hour, the furnace operates with one man at the charge end and one at the discharge end. Bar stock continues through the furnace automatically, the larger sizes being discharged one at a time, and the smaller sizes in small groups. Furnace temperatures range from 1600° to 1800°F., and each piece goes through the same heating cycle as any other piece, so that there is complete uniformity in the heating operation.

Salem's conveyor system is enclosed in the furnace, so there is no reheating of conveyor parts. The stock travels through the chamber in position at all times, assuring proper discharge into the quench. Few, if any, other furnaces provide such an arrangement.

Let Salem engineers give you complete information on the continuous rod heat treating furnace. Call or write today.

SALEM ENGINEERING CO.

SALEM, OHIO

TORONTO, ONTARIO, CANADA LONDON, ENGLAND

When the call is for Steel— look to the

Symbol of Service

UNITED STATES STEEL SUPPLY COMPANY

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STEELS

SERVICE

WHATEVER your steel requirements may be, you can depend on us to give you the best possible service. Our nine conveniently located warehouses try at all times to carry adequate, well-balanced stocks to fill your needs, and our engineers are available to help you solve problems of steel selection, application and fabrication.

When you need steel—Hot Rolled or Cold Finished Bars, Structural Shapes, Plates, Sheets, Alloy Steel, Stainless Steel, Tools, Machinery, etc.—get in touch with our nearest warehouse. You're assured cheerful, thorough and quick attention.

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PITTSBURGH (12)	1281 Reedsdale Street, N. S.	CEdar 7780
ST. LOUIS (3)	21st & Gratiot St., P. O. Box 27	MAin 5235
TWIN CITY	2545 University Ave., St. Paul (4), Minn.	NEstor 7311

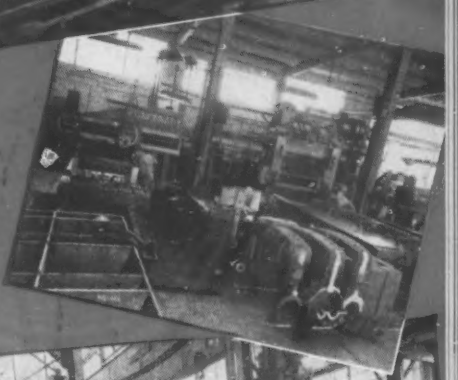
UNITED STATES STEEL

WEAN EQUIPMENT *Corporation*

So that the Company may be more readily identified with its ownership and its products, (strip steel and wire mill equipment), the stockholders of The Broden Construction Company have deemed it advisable to change the name of the Company to WEAN EQUIPMENT CORPORATION.

The continued cooperation of our customers, employees and friends is earnestly solicited.

P. J. Wean
President



e Wean Equipment Corporation's physical properties include the tire completely equipped plant of The Broden Construction Company d in addition all of the buildings, machinery and facilities that were ginally furnished by the Reconstruction Finance Corporation to meet oden's wartime needs. This means that the Wean Equipment Corpora- n has available for its customers' use over 50,000 square feet of build- g area well equipped with the most modern machine tools, cranes and embly area for the production of strip steel and wire mill machinery.

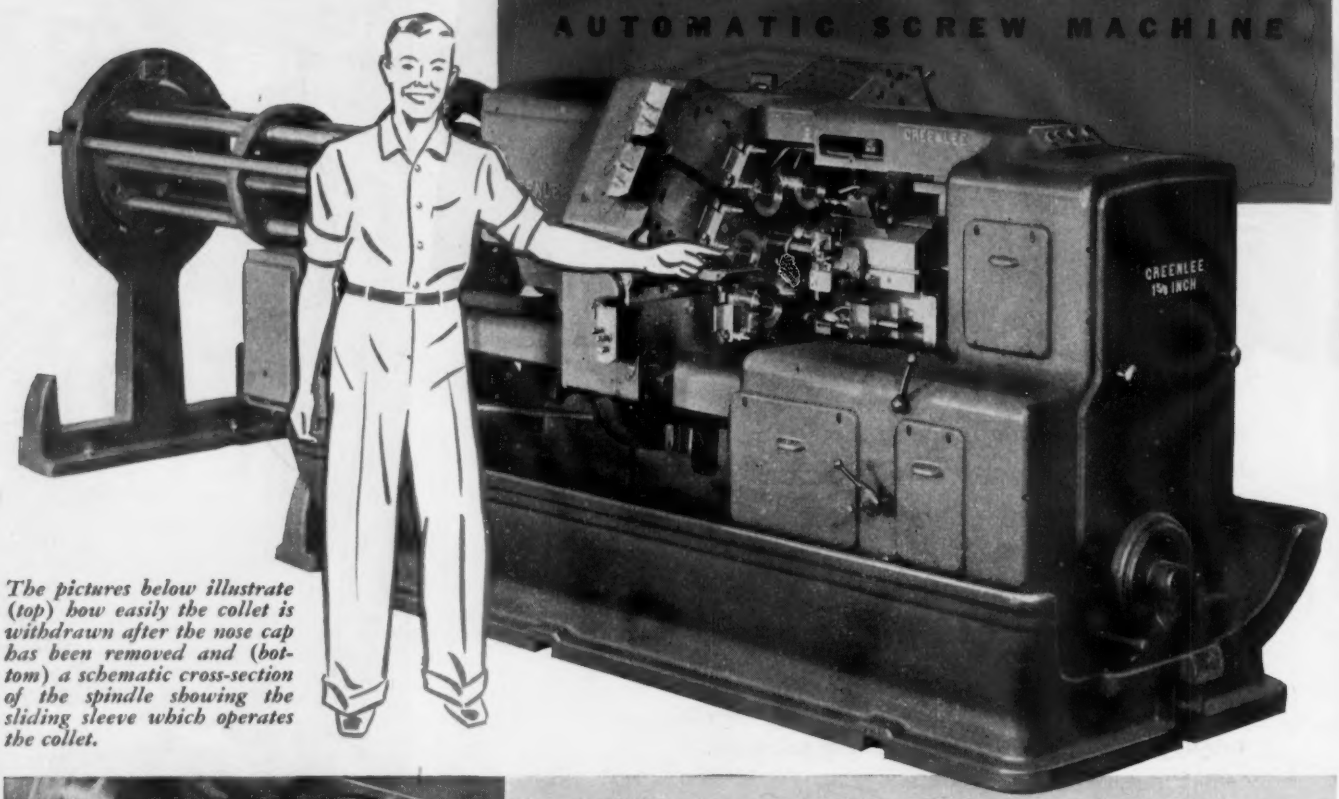
WEAN EQUIPMENT CORPORATION
22800 LAKELAND BLVD. • CLEVELAND, OHIO

"PRECISION and SKILL"

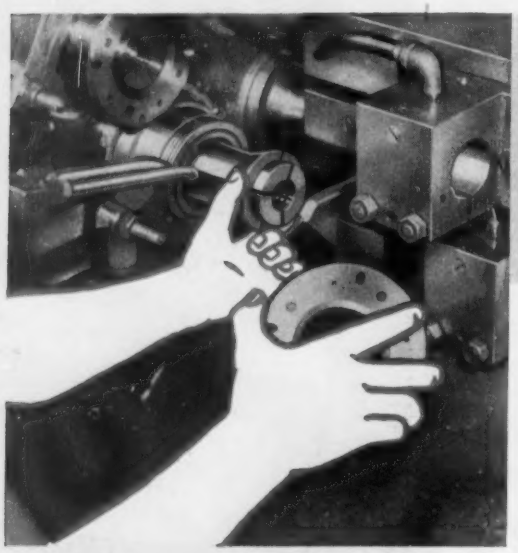
This is a 40-minute, 16mm. sound motion picture which is available to interested groups. It demonstrates important features and uses of the GREENLEE "6". Write for a date.

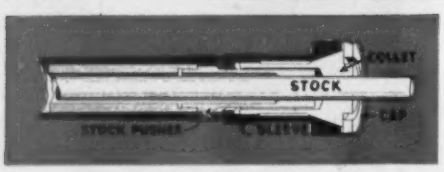
QUALITY AND CONVENIENCE ON THE GREENLEE "6"

AUTOMATIC SCREW MACHINE



The pictures below illustrate (top) how easily the collet is withdrawn after the nose cap has been removed and (bottom) a schematic cross-section of the spindle showing the sliding sleeve which operates the collet.





CAREFULLY MADE SPINDLES FEATURE POSITIVE COLLET HOLDING, ACCURATE FEED

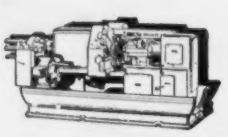
CONSTRUCTION REFINEMENTS: On the Greenlee "6" the spindle assemblies and the carrier in which they are mounted are made with exceptional care and precision to insure accurate work. The spindles are precisely spaced and run smoothly and accurately in double opposed tapered roller bearings. The carrier is a semi-steel casting, heat-treated and accurately ground, with hardened steel inserts for the positive locking block.

COLLET PRINCIPLE: A sliding sleeve acts over the taper of the collet, producing no endways movement of the collet and thus none is transmitted to the stock. Collets and nose caps are easily removed, and all six collets on the GREENLEE "6" can be changed very quickly. These distinctive features provide greater accuracy of work and greater speed and efficiency of change-over.

SEND FOR BOOKLET. Write today for a copy of our 20-page descriptive bulletin "Greenlee Automatic Screw Machine" and learn the many reasons why the GREENLEE "6" is often called "The Operator's Favorite"

PRODUCTION MACHINERY

GREENLEE



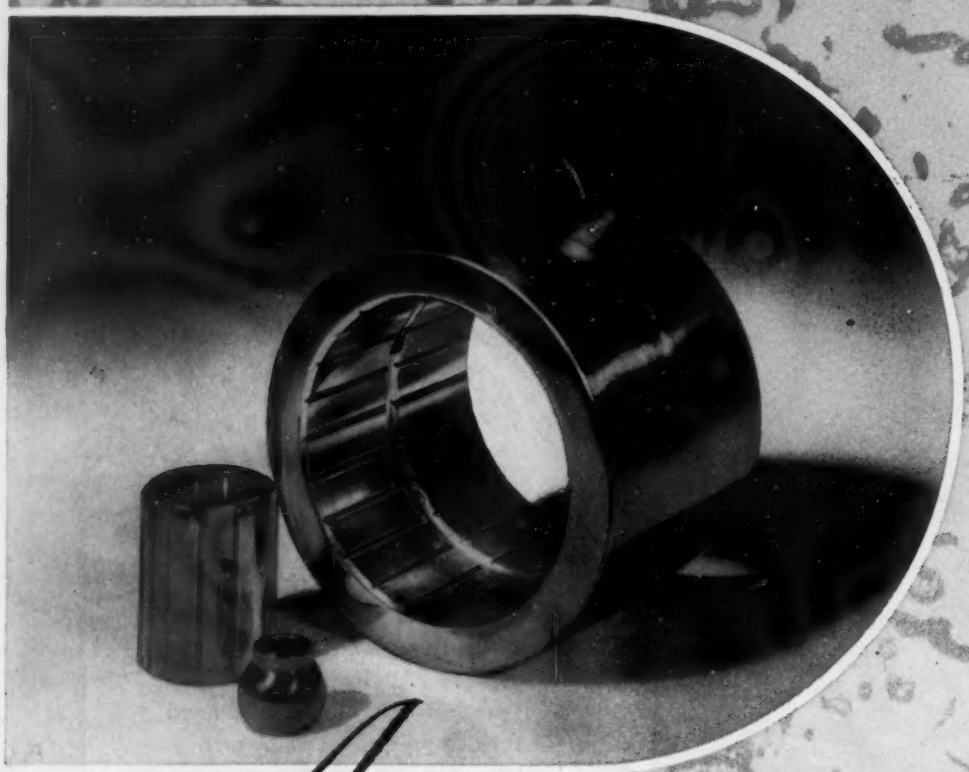
GREENLEE BROS. & CO.

1931 MASON AVE., ROCKFORD, ILLINOIS

WRITE TODAY FOR MORE FACTS

MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES

the paint holds!
Long paint life is only part of the story when you use ARMCO Galvanized PAINTGRIP Sheets for your products. Since there is no need for surface pretreatments of any kind, you save enough in preparation costs to more than pay for the difference between PAINTGRIP and regular galvanized. Most important, you get "customer insurance," because paint on ARMCO Galvanized PAINTGRIP lasts several times longer than on ordinary sheets.
No early peeling or flaking.
No finish complaints. Write for free booklet giving all the facts.
The American Rolling Mill Co.,
4403 Curtis St., Middletown, Ohio.
SPECIAL-PURPOSE SHEET STEELS
GALVANIZED PAINTGRIP
ARMCO
STEEL
THE AMERICAN ROLLING MILL COMPANY



ABILITY to carry heavy loads in limited space is an attribute of the sleeve bearing. Typical of Bunting Bearings used for such applications are the crankshaft main, connecting rod and piston pin bearings of internal combustion engines. On your bearing problems, consult Bunting engineers. The Bunting Brass & Bronze Company, Toledo 9, Ohio. Branches in Principal Cities.

Bunting

BRONZE BEARINGS ☆ BUSHINGS ☆ PRECISION BRONZE BARS

52

War-time Shortage Produced a BETTER RUBBER for TEXROPE V-BELTS

LACK of natural rubber forced the development of synthetic rubbers. And out of this intensive war-time research came a rubber compound that has made today's TEXROPE "Super-7" V-Belts the BEST in 20 years of V-Belt experience!

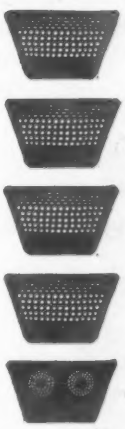
This war-proved Buna-S develops 75% less internal heat. It's tough, durable, resilient. It cushions, insulates and protects the load-carrying cord structure — adds to the service life of the belt.

HEADQUARTERS FOR V-BELT DRIVES

Your nearest Allis-Chalmers office or dealer offers a COMPLETE line of V-Belt equipment — not only the famous Super-7 belts, but also TEXSTEEL, TEXDRIVE and "MAGIC-GRIP" sheaves, VARI-PITCH sheaves, SPEED CHANGERS, engineering service. Supply *all* your needs from one reliable source. ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN.

A 2086

5 Super-7 V-Belts ... TO MEET EVERY NEED



Heat-Resisting Super-7
Stands temperatures up to 180°. The TEXROPE V-Belt for most drives.

Oil-Resisting Super-7
Neoprene cover protects core against moderately oily or greasy conditions.

Oil-Proof Super-7
Made of Neoprene throughout. Use it when the belt must swim in oil.

Static-Resisting Super-7
Recommended where explosion hazard exists. Static-conducting element throughout cover won't wear off.

Super-7 Steel
Twin steel cables, to pull extremely heavy loads with minimum stretch.

GET THEM — through your Allis-Chalmers district office or dealer.

TEXROPE Super-7 V-Belts result from the co-operative research of two great companies—Allis-Chalmers and B. F. Goodrich—and are sold exclusively by A-C.

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

TEXROPE V-BELT DRIVES

Prevent Wear & Tear under heavy duty thrust loads!..Where service conditions demand the best...Rollway Thrust Bearings stand up!

ROLLWAY *precision type* Roller Thrust Bearings,

the Leader in HEAVY DUTY THRUST UNITS

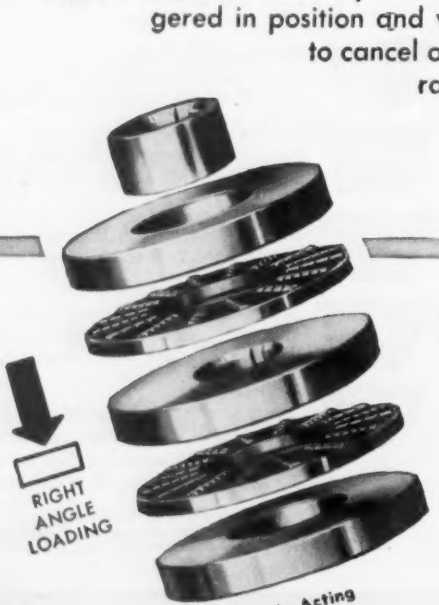
Single-Acting

HERE'S WHY!

1 ROLLWAY carries all loads at right angles to the roller axes.

Single-Acting Aligning

2 ROLLWAY solid-cylindrical rollers — staggered in position and varied in length, so as to cancel out "tracking" — are accurately spaced in machined-bronze retainers.



Double-Acting

3 Thrust plates, held to extremely close limits of parallelism, afford a linear contact with the straight cylindrical rollers, doing away with Brinell effect and roller "pinch outs" with consequent roller-end wear and rubbing friction.

Six basic types in many sizes to choose from. Send a print or detailed description for free bearing recommendation.

ROLLWAY BEARING COMPANY, Inc., Syracuse 4, N. Y.

ROLLWAY CYLINDRICAL ROLLER BEARINGS

SALES OFFICES: Philadelphia • Boston • Pittsburgh • Youngstown • Cleveland • Detroit • Chicago • St. Paul • Houston • Los Angeles

this spring cost 2¢

—BUT IT COSTS TWENTY BUCKS TO REPLACE IT!

● The failure of one small but important spring in your product can be a costly business. Repairs often run into figures out of all proportion to the actual cost of the spring involved. And the inconvenience and the time lost when the machine is out of service certainly do anything but build good will.

With U·S·S American Music Steel Spring Wire you can eliminate spring failures entirely or reduce them to the absolute minimum. Why? Because this high grade spring wire combines extremely high tensile strength, unusual toughness and all-round soundness which make it unexcelled for small, high quality springs that must deliver exacting service.

U·S·S American Music Wire adds so little to the cost, per spring or even per machine, that it more than pays for itself—in better performance, in trouble-free service for the life of the equipment. Its use is a profitable investment in customer satisfaction.

Remember, there is no finer Music Wire produced *anywhere* than U·S·S American. Leading users and makers of fine, quality springs, have found it not merely equal to the best imported spring wire, but definitely *better*. Best of all, this wire is available NOW—for *immediate delivery*—in any quantity you need.

U·S·S AMERICAN

MUSIC WIRE

Steel Spring

If you make it of WIRE... make it of the BEST!

USS AMERICAN MANUFACTURERS WIRE UNITED STATES STEEL

American Steel & Wire Company
Cleveland · Chicago · New York

Columbia Steel Company
San Francisco

Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
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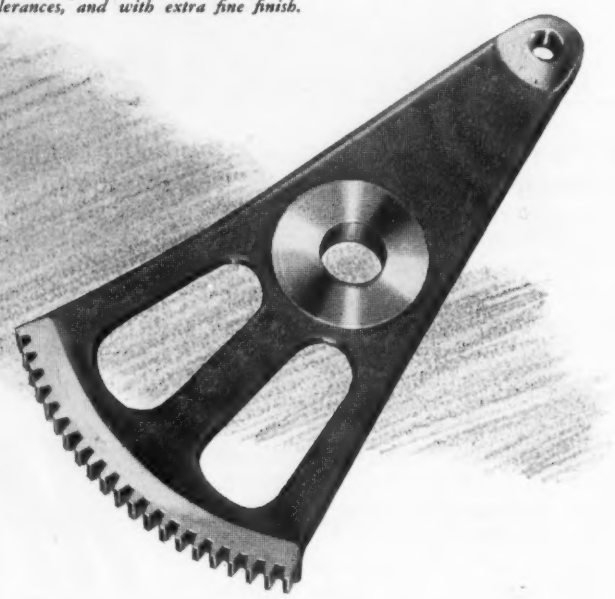
UNITED STATES STEEL

BARBER-COLMAN

HOBS • HOBBING MACHINES • HOB SHARPENING MACHINES • MILLING CUTTERS
REAMERS • REAMER SHARPENING MACHINES • SPECIAL TOOLS

NO. 3 HOBBING MACHINE IS USED TO CUT AN EXTREMELY HIGH-PRECISION QUADRANT GEAR

Close-up showing how a hard bronze quadrant gear is held on a Barber-Colman No. 3 Hobbing Machine to cut 21 teeth, spur form, to unusually close tolerances, and with extra fine finish.



This 21-tooth quadrant gear, made of hard bronze, is one-cut finish hobbed on a Barber-Colman Standard No. 3 Hobbing Machine, holding .0005" concentricity, and .0002" tooth interference (rolled with master at zero backlash). Total cutting time is only 21 minutes in spite of the fact that the machine is "cutting air" a good part of the time. This job demonstrates not only the *high precision* of the B-C No. 3 Hobbing Machine, but also its *versatility* and capacity for *high production.*

ADAPTABLE TO VARIETY OF GEAR JOBS

This particular machine is not a "special", made for one job. It is a standard machine easily and quickly set up for producing spur gears, helical gears and spline shafts of various kinds. If you have a Barber-Colman No. 3 Hobbing Machine in your plant, remember that *this machine is not only highly accurate, but also versatile.* If you are in doubt as to the applicability of a certain piece to this machine, consult your Barber-Colman representative for advice and engineering information.

JOB FACTS

Piece. Quadrant Gear, hard bronze casting, 21 teeth (117 full gear), 32 pitch, outside diameter 3.718", spur form 14½° P.A., ¼" face. Tolerances listed in text.

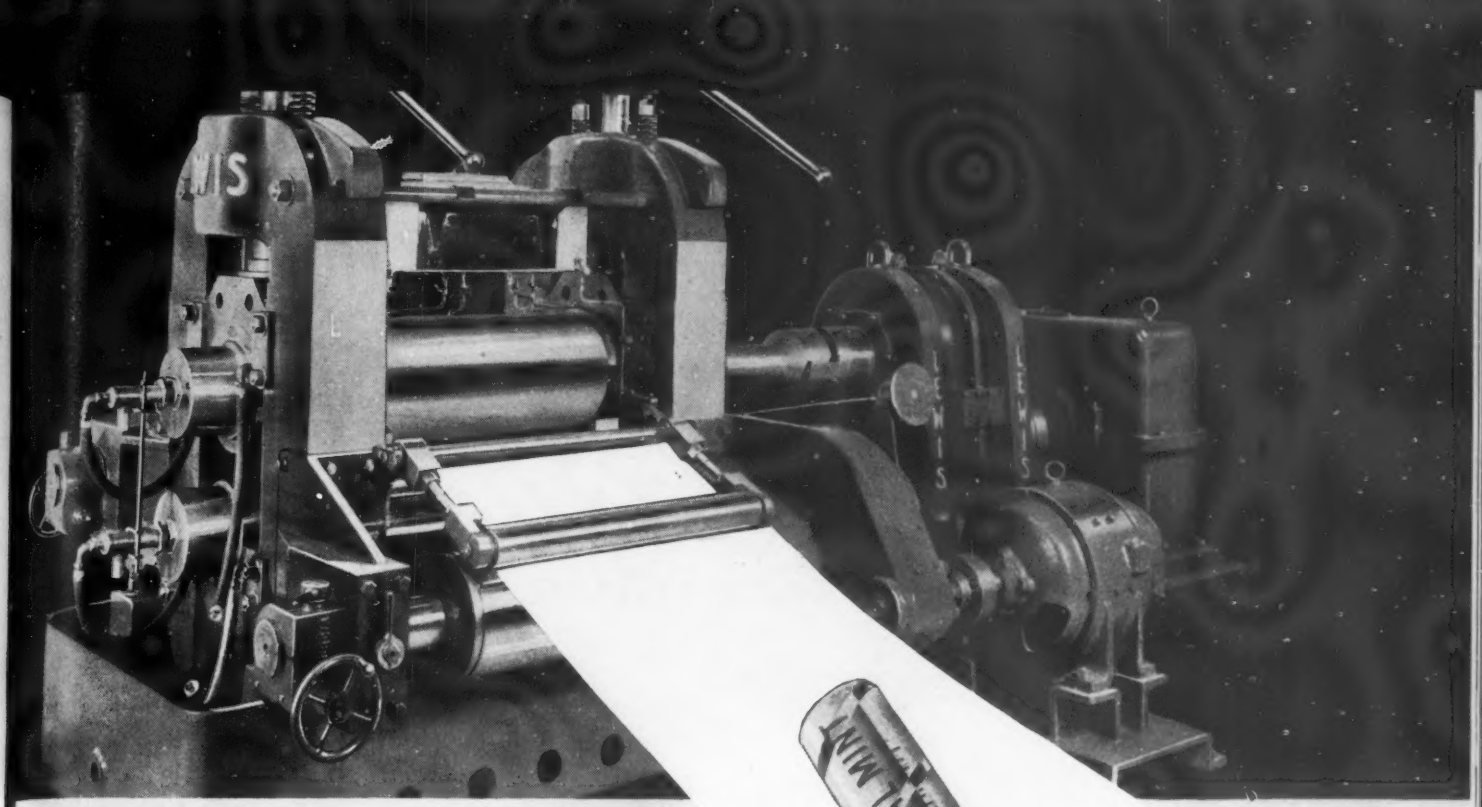
Set-Up. Conventional cut, feed .025" per rev. of work, hob speed 133 r.p.m. Special arbor and driver as shown. B-C Precision Ground Topping Hob.

Production. 21 min. floor-to-floor. Hob life 750 pieces per grind, 5 settings—excellent for hard bronze.

BARBER-COLMAN COMPANY

HOBS, HOBBING MACHINES, HOB SHARPENING MACHINES, REAMERS, REAMER SHARPENING MACHINES, MILLING CUTTERS, SPECIAL TOOLS

GENERAL OFFICES AND PLANT • 121 LOOMIS STREET • ROCKFORD, ILLINOIS, U.S.A.



Name Your Own Tolerances

To Lewis engineers and machinists, a plus-or-minus sign 'way back of the decimal point presents a challenge to their abilities. You'll find how well they meet this challenge in—

LEWIS FOIL MILLS

TWO HI OR FOUR HI

With increasing availability of aluminum, lead and tin for general use, foil producers look to Lewis for rolling equipment whose output is figured in tons, while the product itself is measured in ten thousandths of an inch . . . An important feature of Lewis Foil Mills is the patented Automatic Tension Reel—adjustable to foils of any gauge and tensile strength . . . Write for complete data.

Seven Blaw-Knox plants have been awarded the Army-Navy "E", and have regularly received renewal stars for continued high achievement in the production of war material.

MANUFACTURERS OF ROLLS AND ROLLING MILL MACHINERY FOR THE IRON, STEEL AND NON-FERROUS INDUSTRIES

LEWIS FOUNDRY & MACHINE

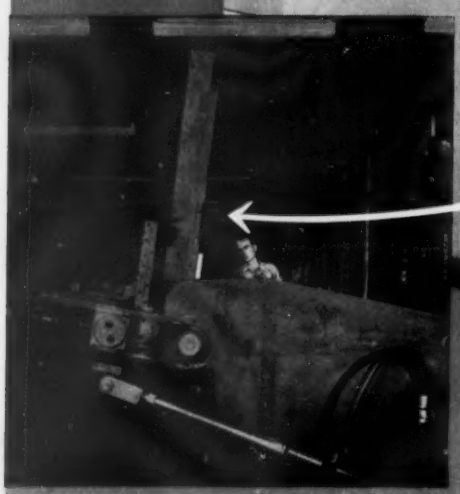
DIVISION OF BLAW-KNOX COMPANY, PITTSBURGH, PA.

STRUTHERS WELLS

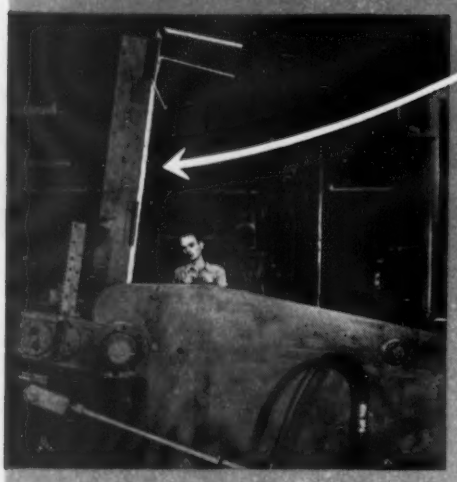
SW TANGENT BENDER

in Action

on the Model 165 York Frozen Food Cabinets



Operation No. 1—Struthers Wells Tangent Bender has just completed the first tangent bend.



Operation No. 2—Tangent Bending of both ends has been completed, thereby producing an integral top and side panel, modernly streamlined.

Here are actual production photographs of the Struthers Wells Single Wing TANGENT BENDER, forming streamlined panels for the luxurious, new Model 165 YORK Frozen Food Cabinets. This is another of the many industrial applications where Struthers Wells TANGENT BENDERS are used for speedy, economical and unique edge bending of sheet steel for tomorrow's more salable products.

Write for Complete Descriptive Technical Bulletin

STRUTHERS WELLS CORPORATION

TITUSVILLE, PENNSYLVANIA, U. S. A.

Offices from Coast to Coast

Represented in the East and Middle West by

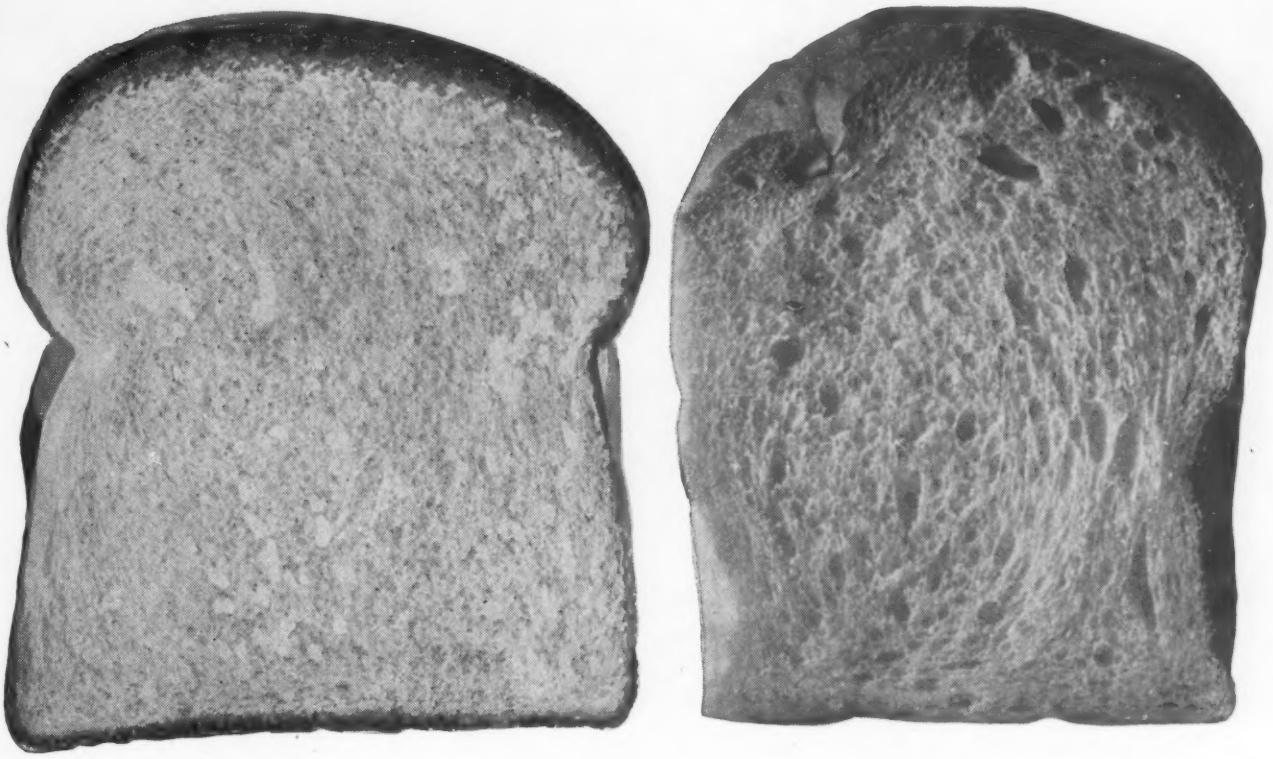
SPECIALTY EQUIPMENT & MACHINERY CORPORATION

New York City, Boston, Philadelphia, Buffalo, Cleveland, Cincinnati, Chicago

Write for the name of our nearest representative

Photographs Courtesy Goodyear Aircraft Corporation, Akron, Ohio

SERVING THROUGH SCIENCE



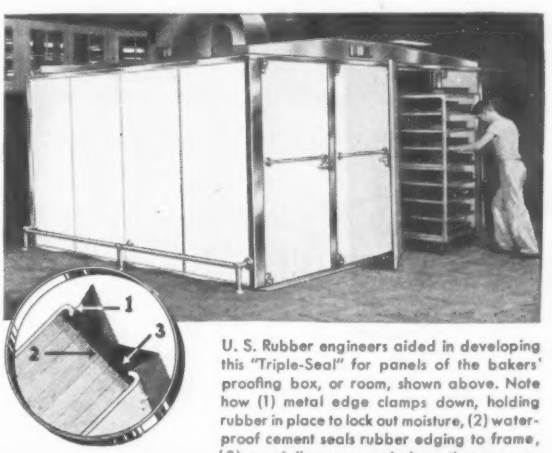
KEEPS DOUGH FROM GOING WILD

Bakers make dough behave by a process called "proofing." Each batch is placed in a proofing room in which temperature and moisture are rigidly controlled while the yeast is at work. On the success of this operation depend the texture, color and taste of the bread after baking.

"Proofing" rooms have to be sealed perfectly. If moisture is lost from the air, the dough may "go wild," or not develop properly to make good bread. Escaping moisture also may soon cause deterioration of the equipment. This happened frequently, until one leading manufacturer traced the trouble to metal-to-metal contact of the panels.

Working with their designers, United States Rubber Company engineers developed rubber-edging for the panels which insured a perfect seal. And these rubber experts evolved a special compound that would last for years. This more satisfactory design is now in wide use in proof rooms of modern bakeries.

Thus another application of U. S. Engineered Rubber came to industry's aid. Such new developments are constantly being found. And this broad service—through science—is available to you, as new needs arise.

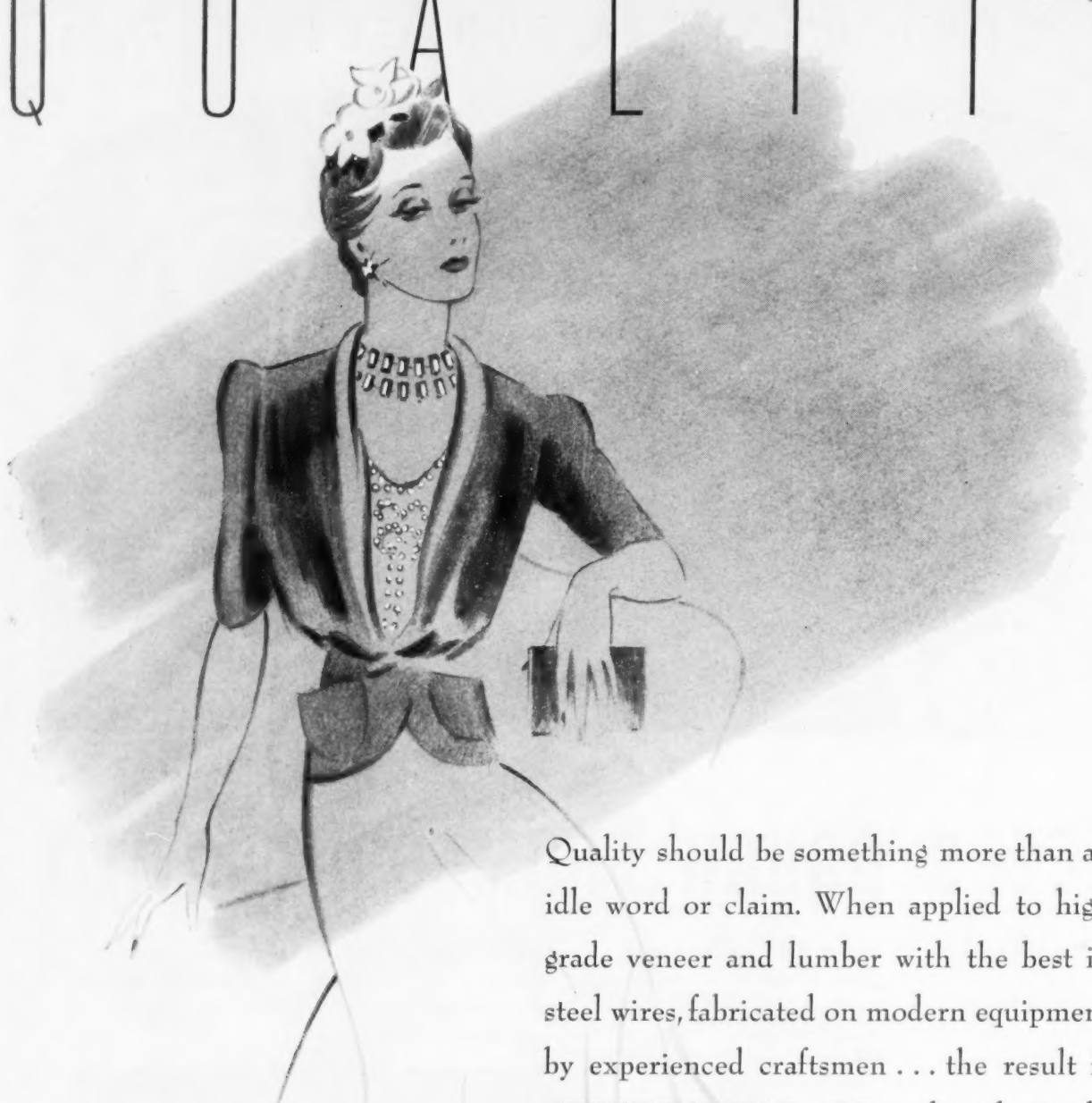


U. S. Rubber engineers aided in developing this "Triple-Seal" for panels of the bakers' proofing box, or room, shown above. Note how (1) metal edge clamps down, holding rubber in place to lock out moisture, (2) waterproof cement seals rubber edging to frame, (3) specially compounded continuous one-piece rubber edging seals all edges.

UNITED STATES RUBBER COMPANY

1230 AVENUE OF THE AMERICAS • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

QUALITY



Quality should be something more than an idle word or claim. When applied to high grade veneer and lumber with the best in steel wires, fabricated on modern equipment by experienced craftsmen . . . the result is SUPERSTRONG — "Bound with Steel."

If you are interested in incorporating SUPERSTRONG quality in your long range requirements, we wish you would let us hear from you.

SHIPPING TRADE SUPERSTRONG MARK CONTAINERS REG. U.S. PAT. OFF.

RATHBORNE, HAIR AND RIDGWAY COMPANY
1440 WEST 21st PLACE • CHICAGO 8, ILLINOIS

Smooth, scratch-free inside surface and uniform concentricity, essential to an oil-tight seal, are highly important requisites of this 1.680" I. D. x 20 gauge x 6½" length of ELECTRUNITE Tube, which forms the pump cylinder of the hydro-electric window lift mechanism found on leading automobiles.

for REPUBLIC ELECTRUNITE TUBING

● Meeting exacting requirements is an old story with Republic ELECTRUNITE Tubing. Consider, for example, the case of this tubular housing of the hydro-electric window lift mechanism used on several leading automobiles. Original design specifications called for a *thin wall* tube with a flaw-free inner surface and *uniform* concentricity throughout its length.

That ELECTRUNITE Tubing meets these specifications is indicated by the thousands of units now in service . . . emphasized, too, by the fact that the manufacturer *plates and flanges the tubes without preliminary inspection.*

This is another example in which the PLUS qualities of ELECTRUNITE Tubing have enabled designers and manufacturers to make better products at lower cost.

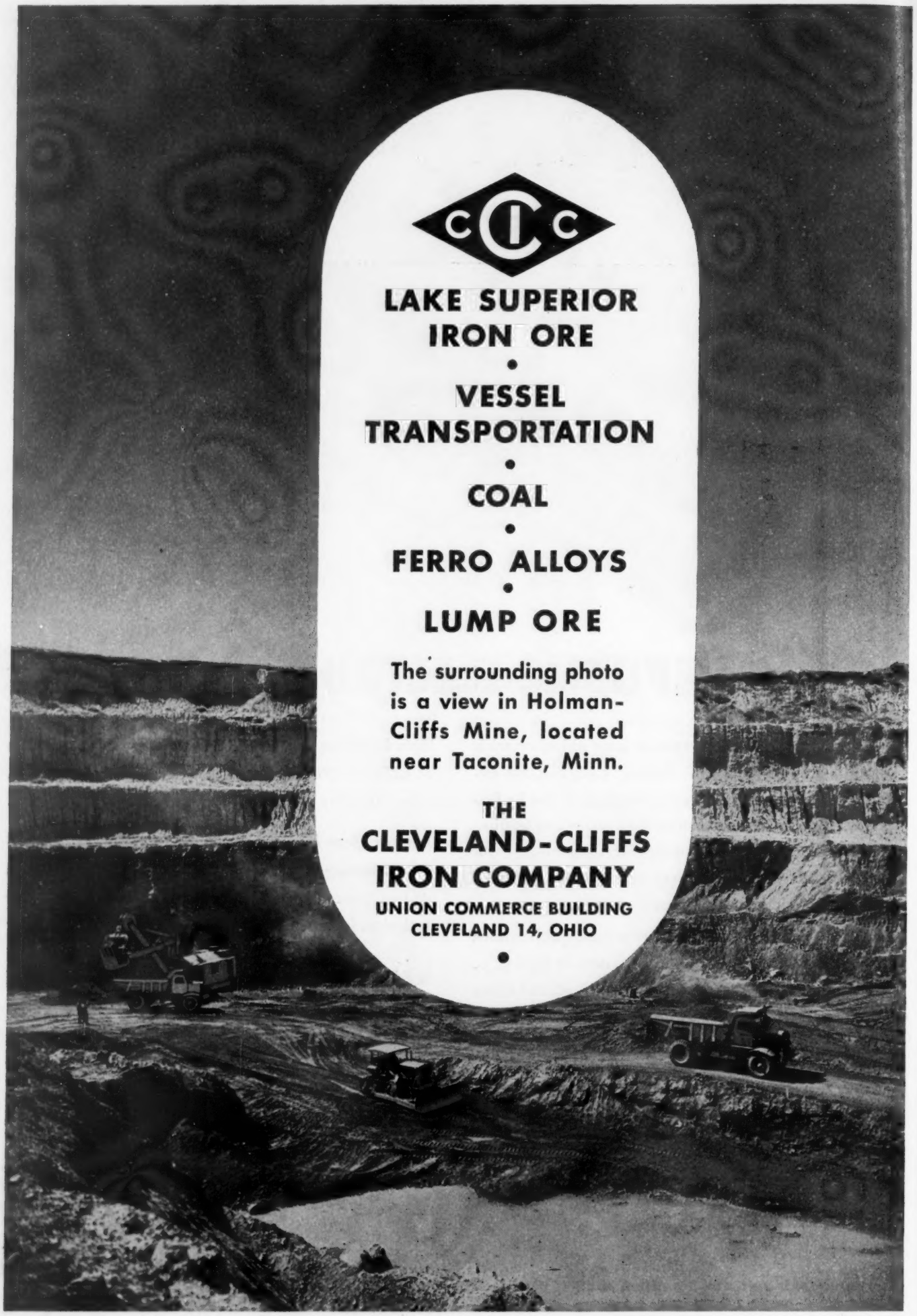
For complete information about Republic ELECTRUNITE Tubing, including a complete list of sizes, gauges and analyses in both carbon and stainless steels, and any technical information which you desire, write *today* to:

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION • CLEVELAND 8, OHIO
Export Department: Chrysler Building, New York 17, New York

SEE OUR EXHIBIT
17th National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York, December 2nd to 6th.

Republic
ELECTRUNITE TUBING
REG. U. S. PAT. OFF.

Mechanical, Aircraft, Stainless Steel and Rail Steel Tubing—Boiler, Condenser and Heat Exchanger Tubes


LAKE SUPERIOR
IRON ORE
•
VESSEL
TRANSPORTATION
•
COAL
•
FERRO ALLOYS
•
LUMP ORE
The surrounding photo is a view in Holman-Cliffs Mine, located near Taconite, Minn.
THE
CLEVELAND-CLIFFS
IRON COMPANY
UNION COMMERCE BUILDING
CLEVELAND 14, OHIO
•

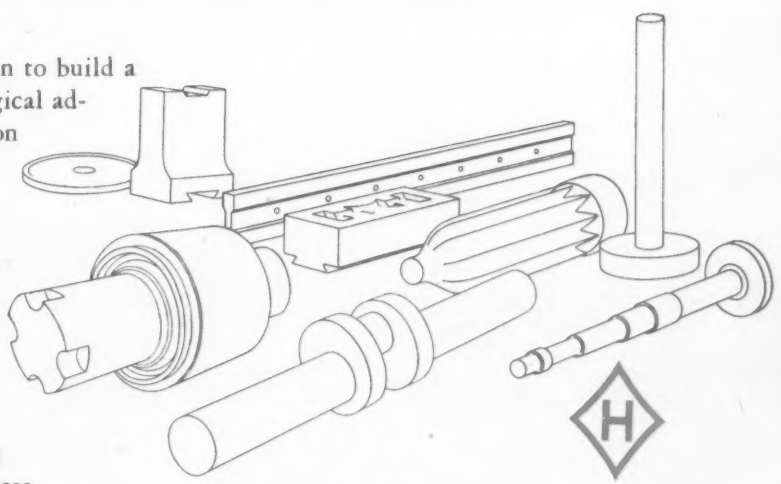
Better your product

and your production with

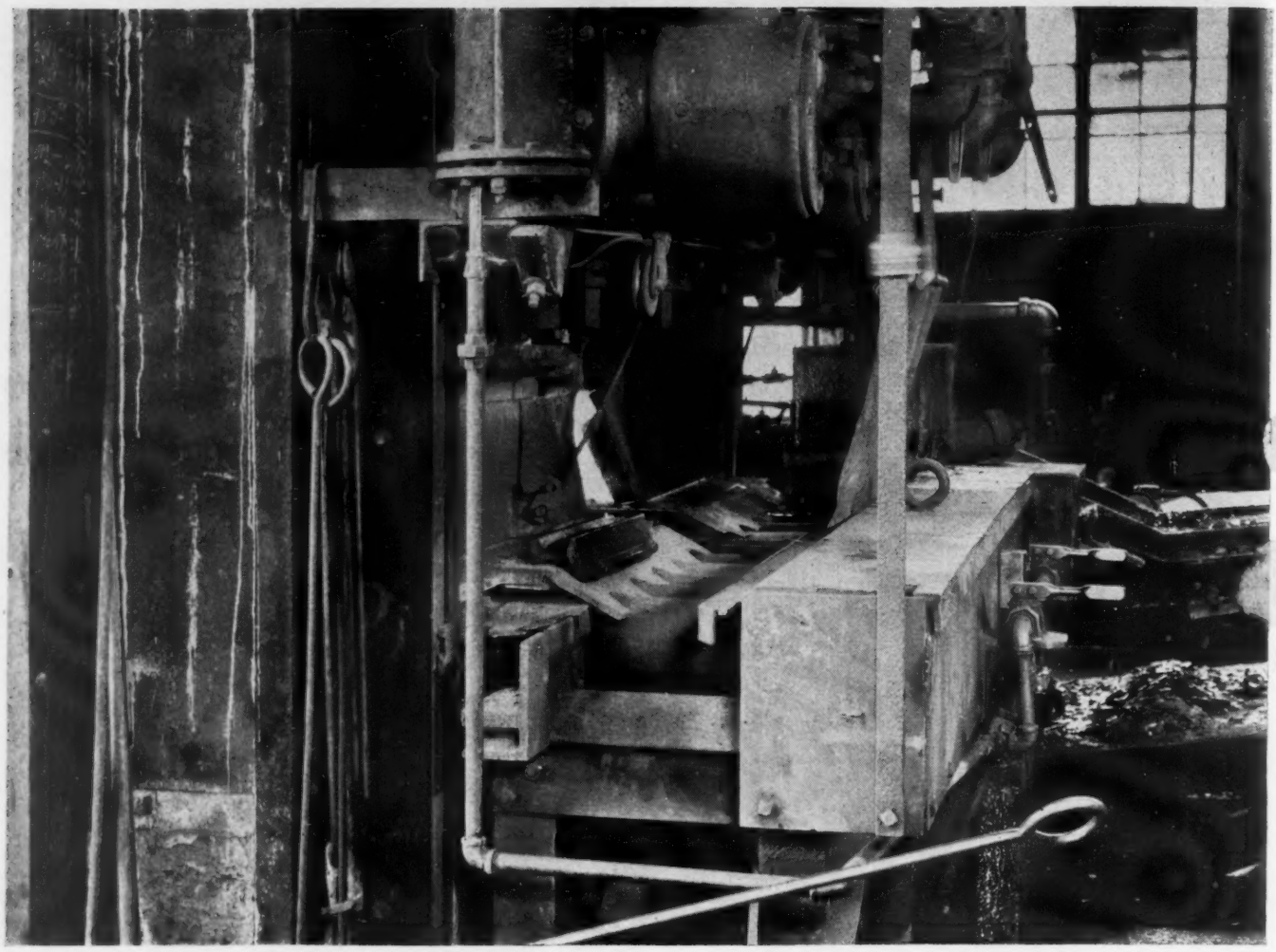
Heppenstall Forgings!

Three generations ago Heppenstall Forgings began to build a reputation. Constant technological and metallurgical advancements—and an undeviating, rigid supervision of quality—have brought them their present day regard by exacting users . . . "For extra safety and maximum service life, there are no finer forgings than Heppenstall."

Consider Heppenstall Forgings for the vital working parts of your products, and for your machines which produce them. In your product, they will assure user satisfaction and repeat sales. In your production equipment, they will eliminate costly maintenance delays, reduce your manufacturing costs . . . Why not investigate these very real ways to better your product and its production?



HEPPENSTALL COMPANY



MULTIPLYING furnace production

Output has increased tremendously since the installation of CARBOFRAX silicon carbide skid rails in this splice bar heating furnace used for reforming splice bars.

Costly shutdowns for repairs and replacement have been eliminated. Long uninterrupted production at lower cost has been attained under rugged conditions. As much as 35.4 tons of bars are pushed through this furnace in 7 hours. Operating temperature is approximately 2300°F.

Before using CARBOFRAX rails, this service proved far too tough for skids formed by 2½" round of low carbon steel. On an average of every six weeks, they were completely shot. To remove and replace them meant a weekend shutdown. Two full working days were lost. In addition, because they warped badly in a short time, these steel skids had to be straightened several times during the short time between replacement. Still further production time was lost.

In excellent shape after two full years of operation, CARBOFRAX skids have required no attention. Not one minute of production time has been lost to shutdowns for repairs to these rails. Furnace output has increased appreciably. Maintenance expense too has been greatly reduced. Such results are made possible by the extreme abrasion resistance and high load carrying strength of CARBOFRAX rails at elevated temperatures.

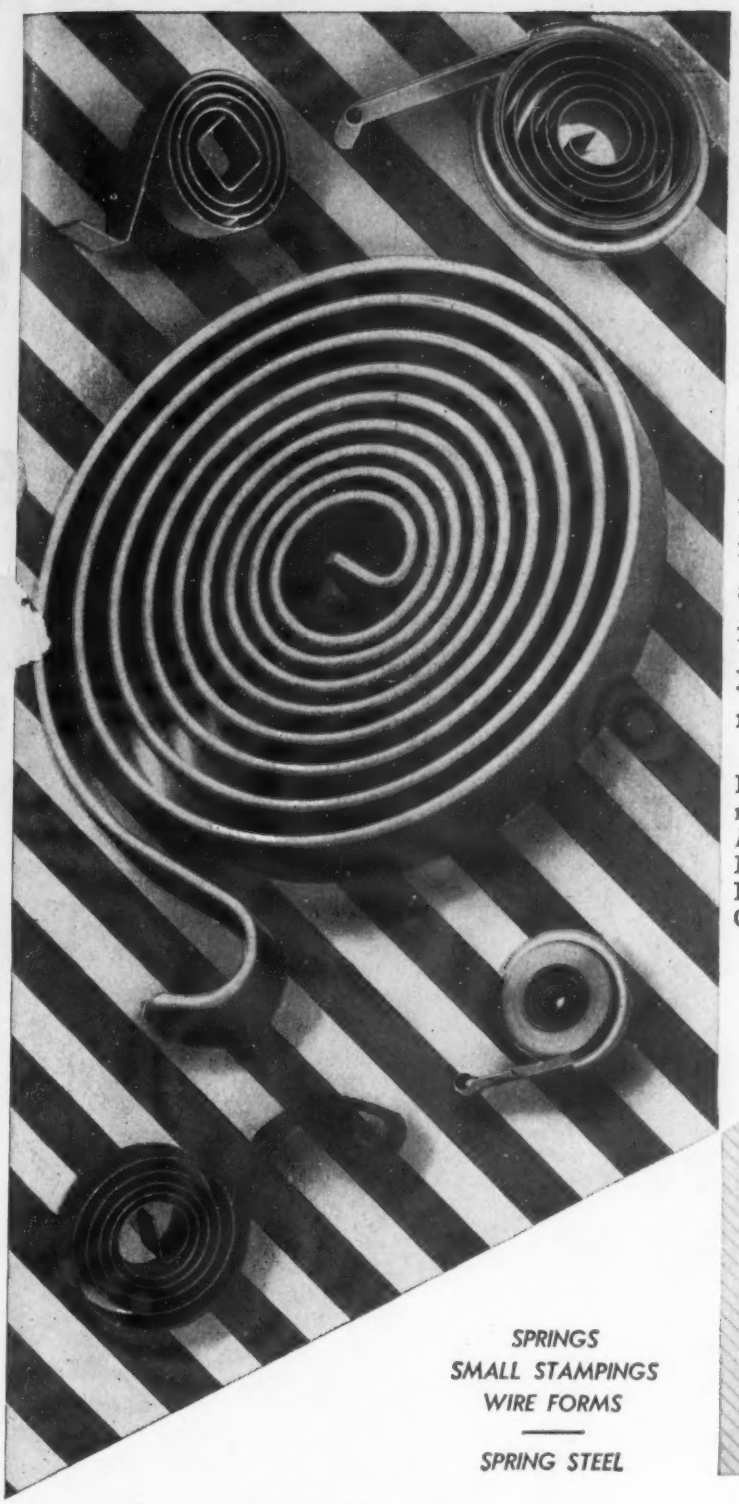
Used in a variety of furnace installations, CARBOFRAX skid rails have promoted greater production and outstanding operating economy. Write Dept. J-116 for detailed engineering data or a personal discussion with one of our engineers. The Carborundum Company, Refractories Division, Perth Amboy, New Jersey.

CARBOFRAX Skid Rails

BY CARBORUNDUM

TRADE MARK

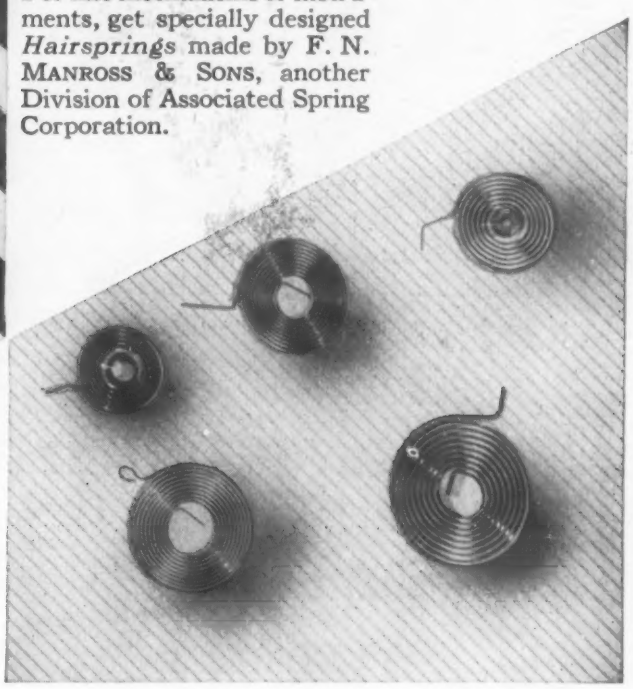
"Carborundum" and "Carbofrax" are registered trademarks which indicate manufacture by The Carborundum Company



Measured "PEP" for motive "POWER"

When you need springs to run things, let Wallace Barnes show you how power in specified amounts can be built into springs for long-lived, accurate duty. Quality starts in the spring steel (also a Barnes product) and governs every step in production. Performance results, accumulated through the years, are ready to apply to your individual requirements.

For fine mechanisms or instruments, get specially designed *Hairsprings* made by F. N. MANROSS & SONS, another Division of Associated Spring Corporation.



SPRINGS
SMALL STAMPINGS
WIRE FORMS

SPRING STEEL

Barnes-made springs
Engineered Pep and Power

WALLACE BARNES COMPANY
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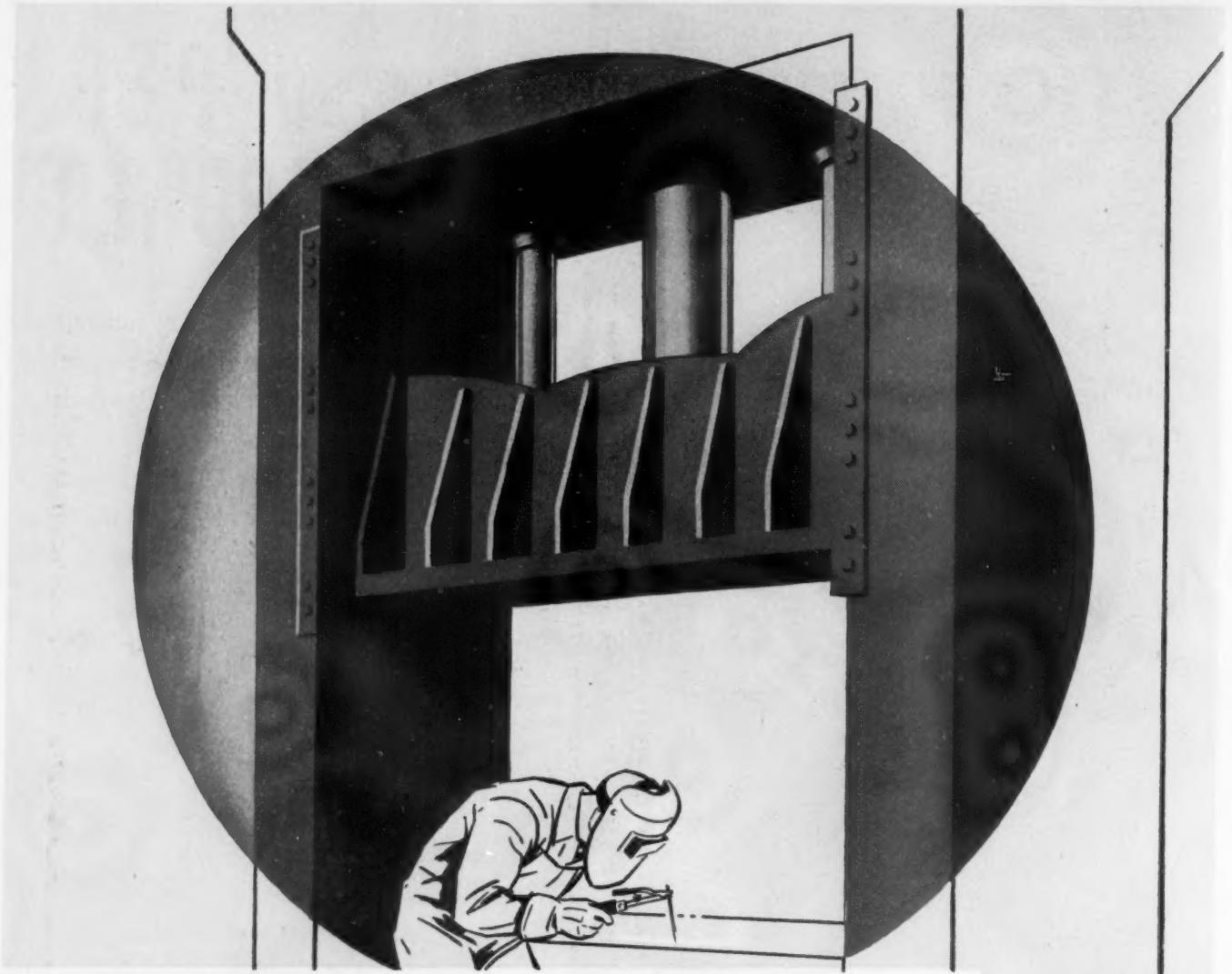
Bristol
Connecticut



"Feather out" YOUR WELDS— FASTER... NEATER WITH.... P&H DH-2

(Class AWS-ASTM E6020)

DH-2 is an improved P&H Electrode carrying a famous old name. It's a completely redeveloped electrode, tested and proved — made better in every way.

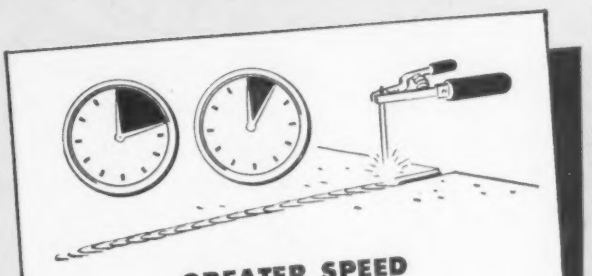
DH-2 weld deposit "feathers out" — for better, neater welds. It's fast! For example, in competitive tests, a prominent manufacturer of giant presses deposited *1½ pounds more metal per hour* than with other electrodes of the E6020 class.

DH-2 out-performs on all flat butt and horizontal fillet work — produces excellent results on all mild and medium carbon steels — without porosity. It's for AC or DC. Welds are machinable as deposited or heat treated.

Prove to yourself DH-2 can give you swifter, better appearing welds. Try it on your work. Call your P&H Distributor today or write for complete information.

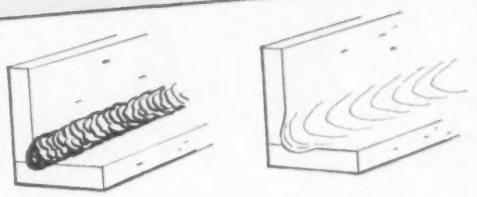
FOR HIGH SPEED, HIGH QUALITY WELDING

—USE DH-2



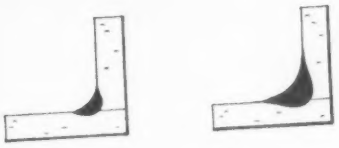
GREATER SPEED

DH-2 is a really fast electrode — for more pounds of deposit per hour, less welding cost. It's easy to handle with minimum spatter loss.



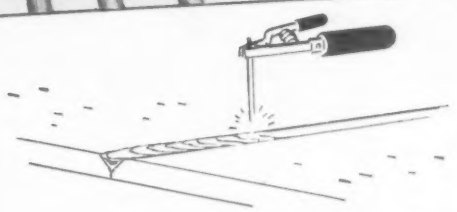
BETTER APPEARANCE

Weld metal "feathers out" — neat and uniform. It eliminates notched effect along weld edge — improves product appearance.



MEDIUM OR DEEP PENETRATION

If you desire medium penetration, you weld at normal amperages. You get deep penetration at high amperages.



FOR DOWNHAND

DH-2 is a "specialist" — designed specifically for horizontal, flat fillet and groove welding — proved the country over.

"SM"	"FR"	"CM-5O"	"FW"	"AC-3"	"PF"	"AC-1"	"AP"
AWS E-6013	AWS E-6012	AWS E-7011	AWS E-6020	AWS E-6013	AWS E-6012	AWS E-6011	AWS E-6010

P&H

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HARNISCHFEGER CORPORATION

WELDING ELECTRODES • MOTORS • HOISTS P&H ELECTRIC CRANES • ARC WELDERS • EXCAVATORS

SEE P&H—FOR ALL ELECTRODE REQUIREMENTS

DH-2 is one of many types of P&H electrodes which meet every welding need. Above are just a few of the complete P&H mild steel group. Ask for complete line booklet R-7.

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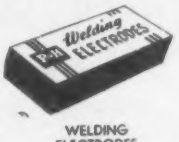
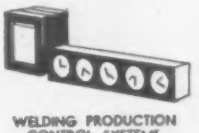
DC WELDERS

AC WELDERS



WELDING ELECTRODES

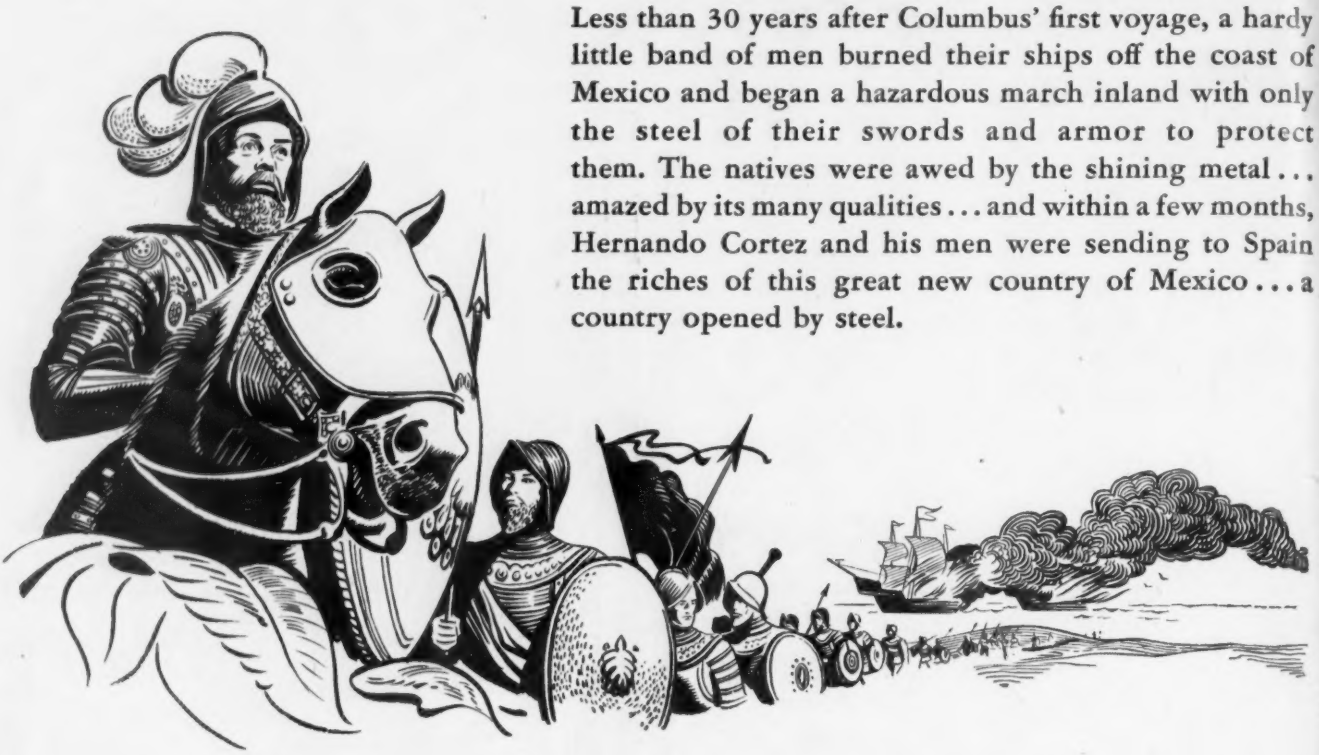
WELDING POSITIONERS



WELDING PRODUCTION CONTROL SYSTEMS

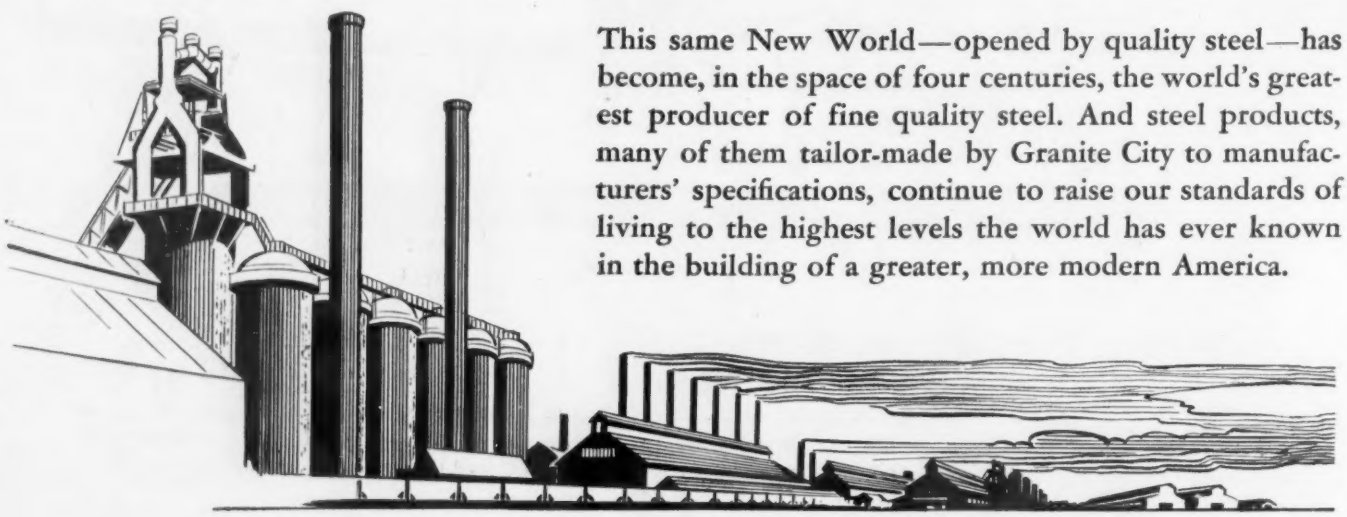
ELECTRIC HOISTS

In 1521 . . Quality Steel Opened . . A Great New Country . . .



Less than 30 years after Columbus' first voyage, a hardy little band of men burned their ships off the coast of Mexico and began a hazardous march inland with only the steel of their swords and armor to protect them. The natives were awed by the shining metal . . . amazed by its many qualities . . . and within a few months, Hernando Cortez and his men were sending to Spain the riches of this great new country of Mexico . . . a country opened by steel.

TODAY . . Quality Steel from Granite City . . Makes Our Own Country Even Greater



This same New World—opened by quality steel—has become, in the space of four centuries, the world's greatest producer of fine quality steel. And steel products, many of them tailor-made by Granite City to manufacturers' specifications, continue to raise our standards of living to the highest levels the world has ever known in the building of a greater, more modern America.

Hot Rolled Sheets • Cold Rolled Sheets
Strlplates • Stainless Clad
Tin Plate • Terne Plate • Electrical Sheets
Tin Mill Products
Porcelain Enameling Sheets

Granite City Steel Company

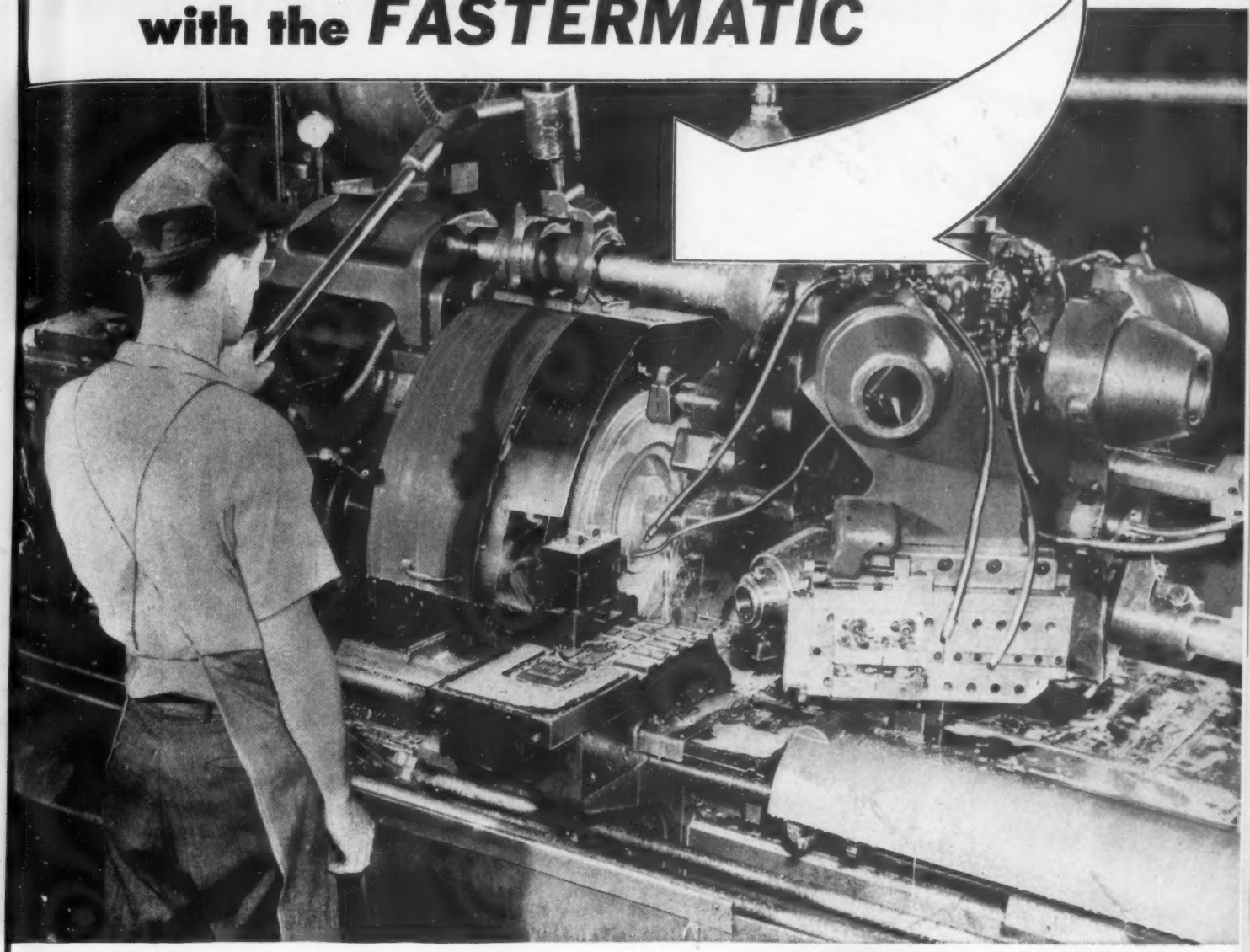
GRANITE CITY, ILLINOIS

Chicago • Cleveland
Houston • Indianapolis
Kansas City • Los Angeles

SINCE GRANITE CITY STEEL 1878

Milwaukee • Memphis
Minneapolis • Moline
New York • St. Louis

Removing 27 lbs. of metal—FAST with the FASTERMATIC



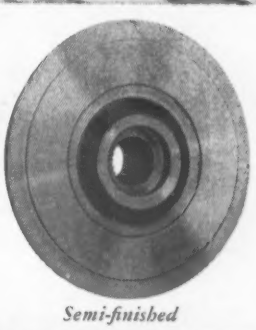
• Here's the kind of operation that makes this automatic turret lathe ideal to put heavy chucking work on a swift production basis.

With multiple tooling on the cross slides and turret faces, this Fastermatic removes 27 pounds of metal from a 95-pound steel casting in 17 minutes including turret indexing time. During this completely automatic cycle, close tolerances are obtained in boring and outside turning—and a total of 15 cuts are taken.

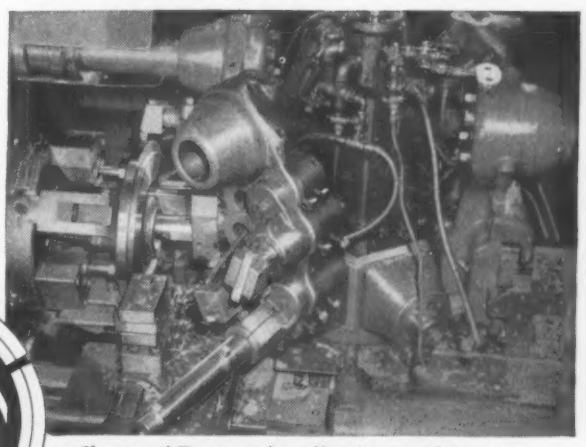
It's another example of the way that power and multiple tooling can be applied on the Fastermatic to handle a larger number of operations in one chucking. With a completely automatic machining cycle, quick indexing, fast traverse, and automatic feed changes, the Fastermatic cuts idle time to a minimum—cuts costs to the bone.

Ask for facts on how the Fastermatic can cut costs on your specific work.

Rough Casting



Semi-finished



Close-up of Fastermatic tooling for machining 95 lb. transmission carrier. The Fastermatic has the power and rigidity for heavy chucking work and the permanent accuracy for precision in all work.

GISHOLT MACHINE COMPANY

1217 E. Washington Ave. • Madison 3, Wis.

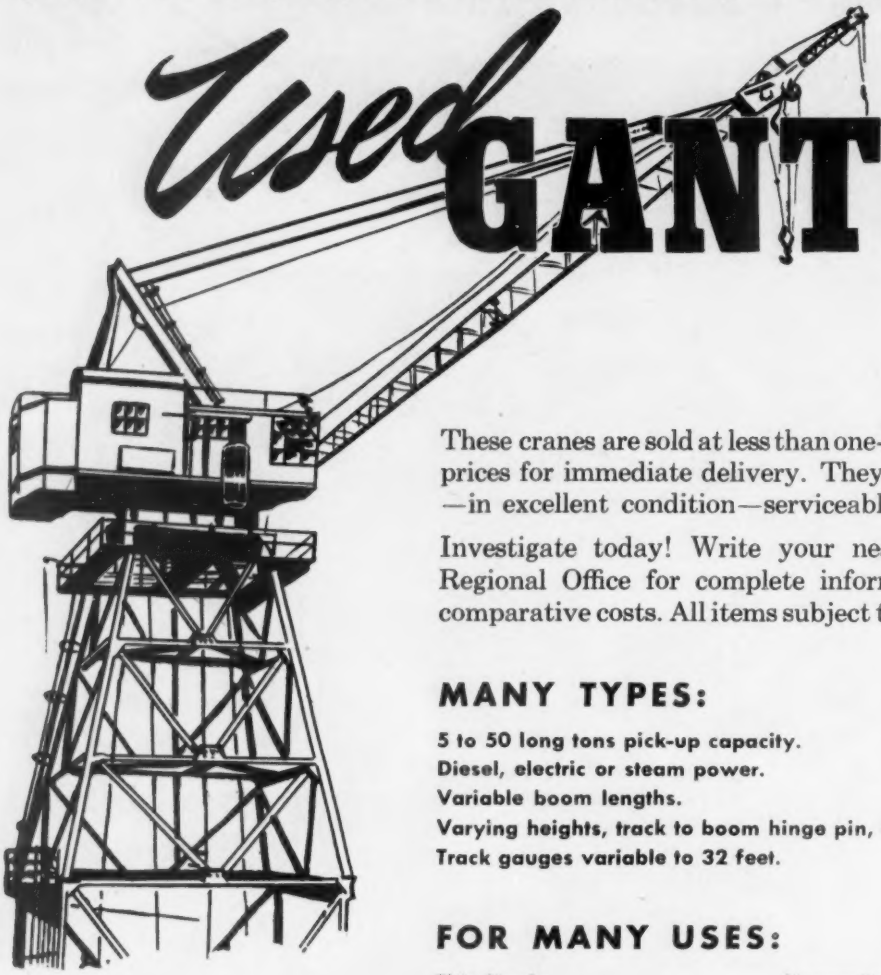
Look Ahead . . . Keep Ahead . . . with Gisholt

GISHOLT

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

$7,000 to $24,000 F.O.B. LOCATION • IMMEDIATE DELIVERY

Used GANTRIES



These cranes are sold at less than one-half today's prices for immediate delivery. They are rugged —in excellent condition—serviceable for years.

Investigate today! Write your nearest WAA Regional Office for complete information and comparative costs. All items subject to prior sale.

MANY TYPES:

5 to 50 long tons pick-up capacity.
Diesel, electric or steam power.
Variable boom lengths.
Varying heights, track to boom hinge pin, 40 to 70 feet.
Track gauges variable to 32 feet.

FOR MANY USES:

Ship Yards	**Heavy Construction**
Coal Yards	**Dams**
Docks	**Levees**
Sorting Yards	**Breakwaters**
	Caissons

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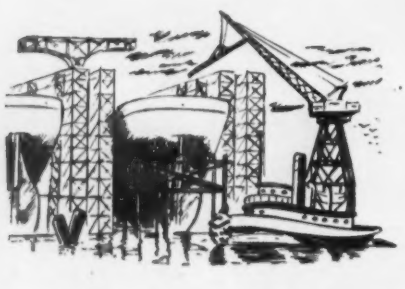

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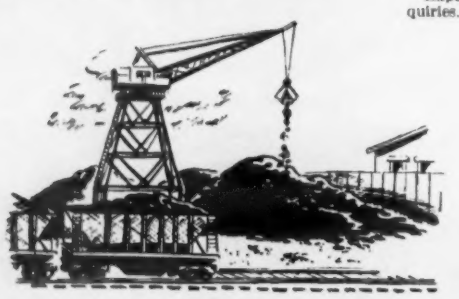

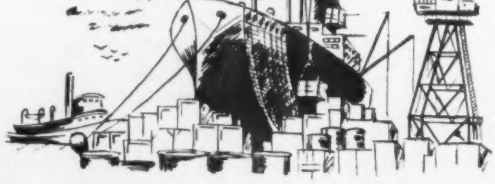

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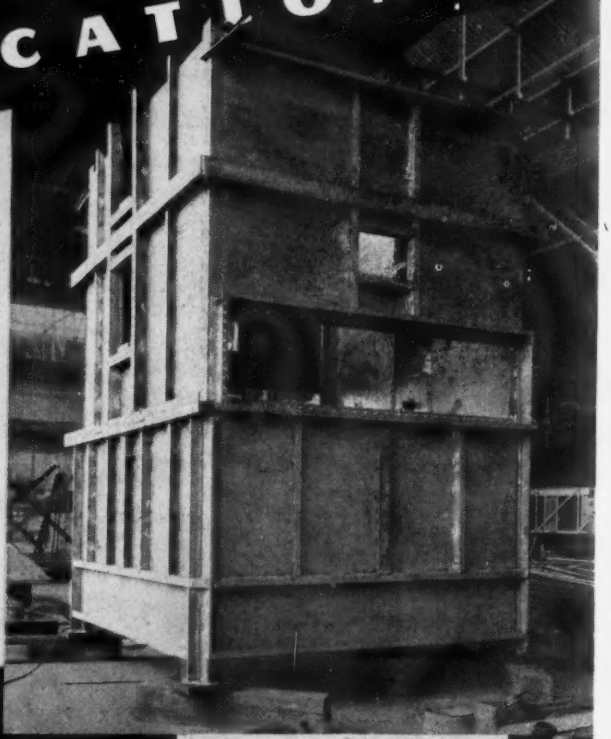

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STEEL

The Magazine of Metalworking and Metalproducing

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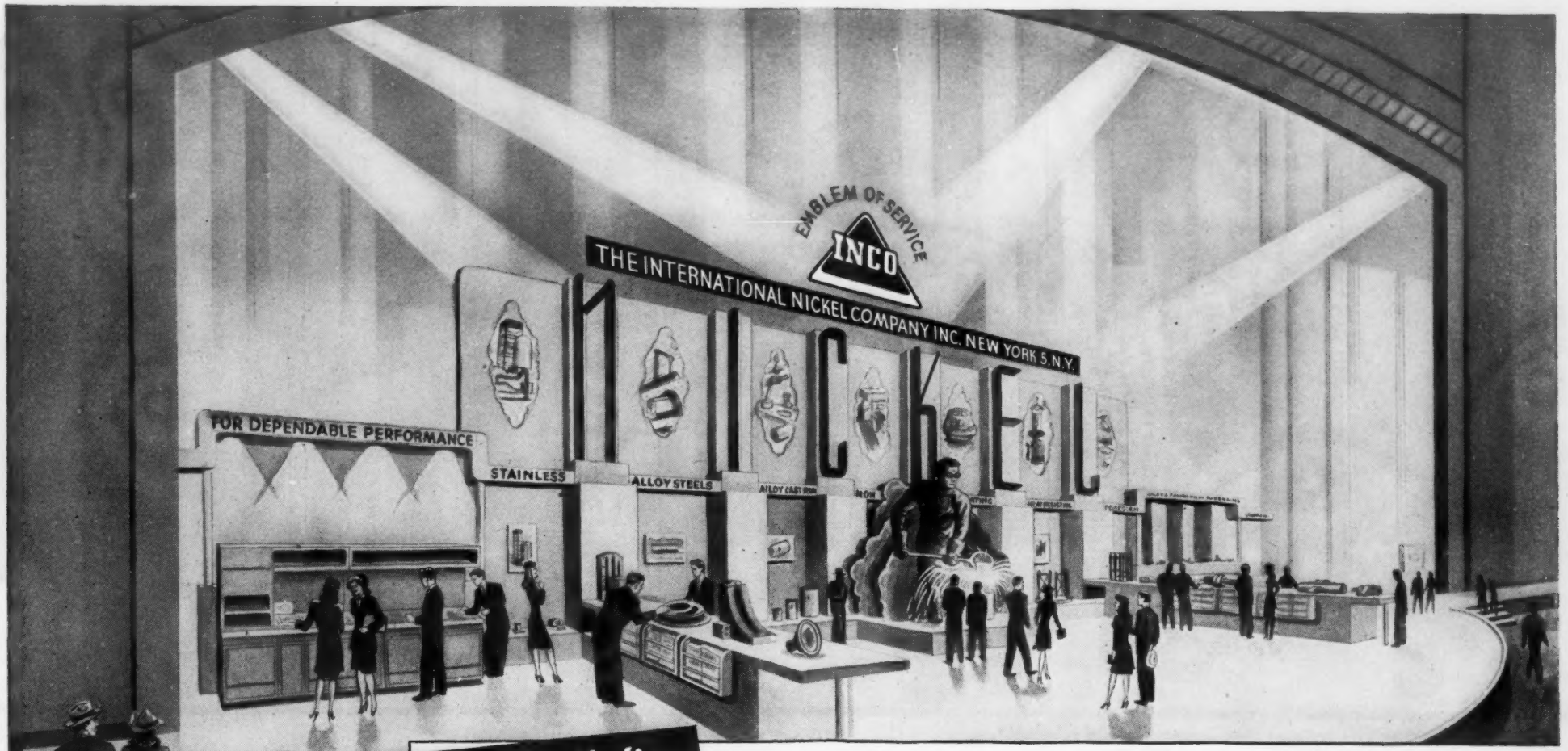

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As the EDITOR VIEWS the NEWS

The Great Challenge

In the statement accompanying his order to remove all controls on wages and salaries and on all price ceilings except those on rent, sugar and rice, President Truman summed up several paragraphs of labored explanation with these words: "In short, the law of supply and demand operating in the market place will, from now on, serve the people better than would continued regulation of prices by the government."

Most readers of this page will not consider this statement excessively dramatic. It rings true to them because with few exceptions persons identified with industry have a profound respect for the law of supply and demand, gained—more often than not—from realistic experience. Likewise, most industrialists are ingrained with a natural distrust of artificial substitutes for the law of supply and demand, such as a planned economy operated by push-button control from Washington. Therefore, Mr. Truman's statement that the law of supply and demand will serve the people better than bureaucratic dictation is music to the ears of industrialists.

However, it is anything but music to those who ran with the New Deal. To them it is treason. For a President to utter a word of praise for an "outmoded" natural law such as that of supply and demand is utter heresy to the tenets of those zealots who believe that the fountain head of all worldly wisdom was in the catacombs of Washington bureaucracy. To the scores of dyed-in-the-wool New Dealers who gloated in the boast that "we planned it that way," who exulted in the belief that Mother Washington "knows best" and who generally treated citizens as if they were incompetent wards in an asylum, the forthright statement of Mr. Truman that there is merit in the law of supply and demand must be anathema.

The President's belated good word for a natural law—prompted no doubt by the peoples' vote of Nov. 5—marks an important turning point in American history. It heralds a new period of opportunity for private enterprise. It likewise carries a challenge to business to conduct its affairs in a way that will win public approval.

This challenge is the most important problem confronting industry today. If industrial executives meet it courageously with intelligent leadership and studied restraint, they may make the system of private enterprise the great savior of the postwar world. If they flunk it by greediness, stupidity or default, the world will sink into a chaos of conflicting totalitarianisms.

STEEL
November 18, 1946

TIME FOR RESTRAINT: As was to be expected, the first reaction to the removal of price controls was a scattering of independent price announcements ranging from fairly sharp advances over late OPA ceilings to reaffirmation of OPA levels.

The spotty character of these price actions reflects the distortions that had been caused by federal price control. General Motors, for instance, justifies its increase of $100 per car on the ground that OPA had discriminated against GM by refusing to grant ceilings as favorable as those granted other automobile manufacturers. Prices of some unprofitable steel products may rise moderately, while others remain unchanged. Some nonferrous metals—notably zinc, lead and copper—are up from 1¼ to 3⅛ cents above former ceilings.

These and other price changes are the initial efforts of sellers to erase inequities, discrimination and other abnormalities and also to improve the short-term profit situation. The higher prices will spur production and increase the volume of goods available, but at the same time they will encourage de-

(OVER)

mands for higher wages and invite increasing resistance on the part of buyers. At some future time competition will exert increasing pressure for lower prices.

Timing and sequence of these several factors will be highly important. The more restraint exercised during the early stages, the easier will be the transition from an artificial to a natural economy. —p. 51

• • •

NO LEASE SIGNED YET: Reasons why government efforts often are slow and ineffective are found in the story of the federal shipbreaking program.

Last July CPA launched a campaign for scrapping obsolete and damaged vessels in order to get the resulting scrap to steel mill yards before winter. The idea was to lease surplus shipyards to scrap dealers for use in breaking ships.

Maritime Commission was willing to offer ships for breaking, but under the Surplus Property Act sales had to be at the highest price developed in competitive bidding. Leasing of shipyards proved difficult, not only because the interests of WAA, CPA, MC, USN and other agencies were involved, but also because of the multiple ownership of the yards. Also there was delay in determining the amount of rent shipbreaking lessees should pay.

To date not a single contract for leasing a shipyard has been placed. Small wonder that the public voted for a freer private enterprise in order to get things done! —pp. 61, 72

• • •

PREVENTION AND CURE: In working out the problem of removing dirt from diesel engine blocks, heads and smaller parts, officials of the Detroit Diesel Engine Division of General Motors Corp. adopted a painstaking program of dust and dirt prevention and removal that could be utilized to advantage by many other companies.

First, the plant's dust laboratory organized a real cleaning job. Pans 1 ft square were placed at various points throughout the plant, left for 48 hours, collected and the accumulated dust weighed. This revealed the major trouble areas to be near milling and boring machines. Large exhaust fans were installed to minimize this difficulty, after which three washing machines—one for heads, one for blocks and one for smaller parts—were developed to thoroughly clean all parts of the motor assembly.

This solution of the problem has the merit not only of providing a more effective cleaning procedure but also of reducing the amount of dust to which parts are exposed. —p. 108

SIGNS OF THE TIMES: Speaking at the annual meeting of the National Founders' Association, C. E. Brewer of the National Recreation Association declared that the trend is away from management paternalism in employee athletics. Employers are less inclined than formerly to spend large sums for plant-owned athletic fields and buildings. Mr. Brewer suggested that in some instances (p. 57) it will be better for employees to use community facilities and to engage in the activities of the community in which they live. . . . In manufacturing adjustable chairs in its Buffalo plant, Barcalo Mfg. Co. degreases tubular metal frames by conveying them into a 17-ft oven where infrared energy (p. 104) raises the temperature of the metal sufficiently to burn off the grease deposit in 2½ min. . . . . So much attention is being bestowed upon the price and wage regulations that have been removed that one tends to overlook the impressive number of controls which are still operative (p. 54) in connection with CPA and other alphabetical agencies. . . . Use of a 6 station work unit coupled with a 20-kw induction seating unit for soft soldering radiators permits the Tractor Division of International Harvester Co. to turn out 28 radiator assemblies per hour (p. 96), which compares with a production rate of 10 assemblies per hour when hand methods were employed. . . . Steel production on the West Coast, threatened increasingly by an acute shortage of scrap (p. 72), is further aggravated by the shutdown of one Utah blast furnace for a long overdue relining. Also, should a coal strike occur, operations of Geneva Steel Co. would be halted soon thereafter. Geneva currently is operating two blast furnaces, two batteries of coke ovens, three open hearths and rolling one shift on the slab and bloom mill and two shifts on the plate mill. . . . Strikes in Belgian iron and steel works afford an interesting sidelight on the low level of European wages. Some employees are holding out for a minimum of 30.5 cents per hour (p. 64), against an offer by employers of 30 cents per hour. . . . H. N. Mallon, president of Dresser Industries Inc., told salesmen and technical experts of member companies that the increasing ability to produce petroleum products from natural gas and coal, as well as from crude oil (p. 70), assures a "healthy market" for oil and gas equipment. . . Steel ingot production in October totaled 6,970,235 net tons (p. 58), a new peacetime record.

E. C. Shane

EDITOR-IN-CHIEF

How to Lower The Machine-Side Cost of Steel

Steel is a low cost large tonnage product when compared with other metals. But the net cost delivered alongside your machinery and equipment varies greatly in different plants depending upon the mill methods of packing and shipping—and the manufacturers' methods of receiving and handling.

The preservation of quality is still another factor in final machine-side delivery. For these reasons Inland packing and shipping experts are always studying and trying new and better methods that will not only protect the quality but lower the delivered cost of steel.

They are also glad to work on your particular problems—determining the method of transportation; type of cars or trucks required; sizes of lifts or packages; protection needed for material in transit; methods of unloading; character and capacity of unloading and handling equipment... all important factors in net costs of delivered steel.

Proof of results is revealed in cases where unloading costs were reduced by 75% . . . car unloading improved from 6 to 16 cars in eight hours . . . storage space reduced 40% . . . and there are many other cases of important savings for Inland customers.

We are still unable to meet the great demand for Inland steel . . . but we are always glad to cooperate with our customers in determining not only the right steel for their particular needs but also to aid them in developing the lowest possible machine-side cost of steel.

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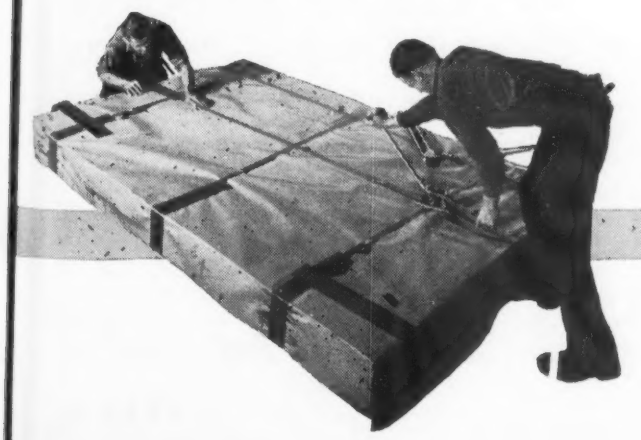

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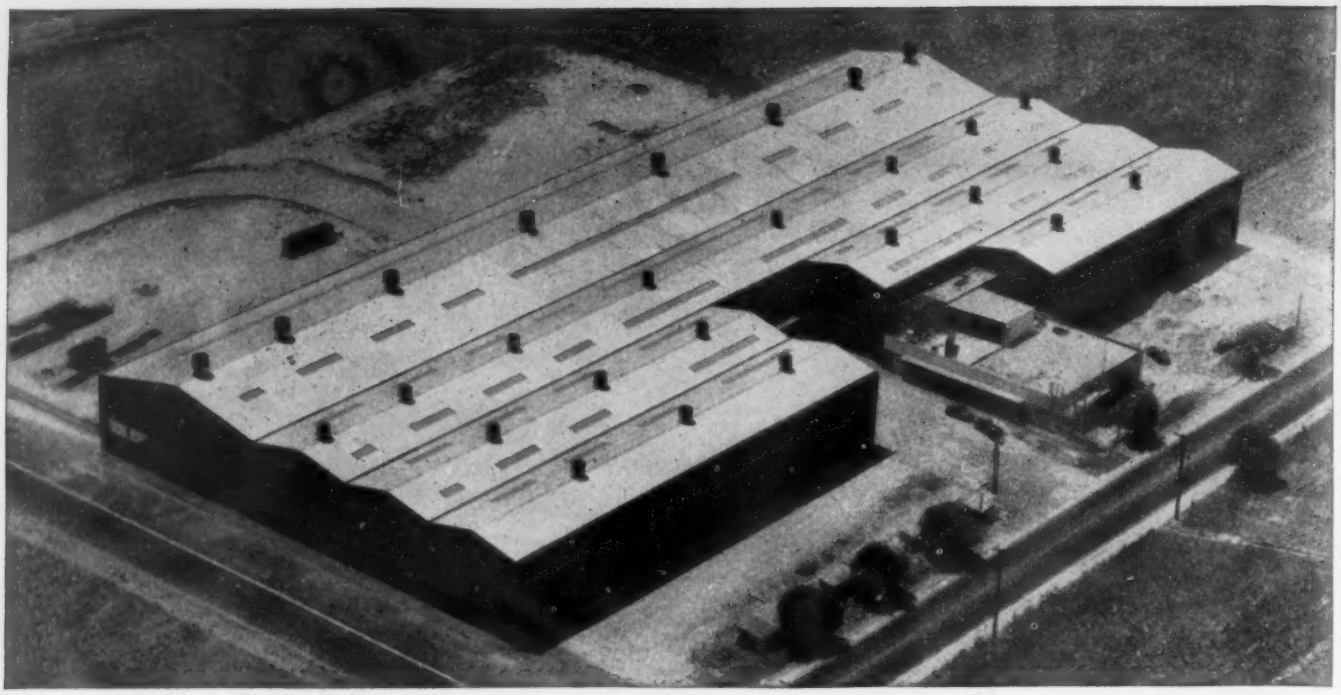

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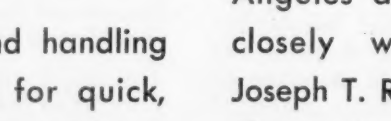

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RYERSON STEEL

STEEL
November 18, 1946

Conservative Policy on Steel Prices Seen

Decontrol not followed by precipitate upward adjustments in price schedules. Producers expected to move slowly in effecting changes though early increases hinge on developments with respect to labor and raw material costs

INDICATIONS are steelmakers will move cautiously in effecting any upward adjustment in their price schedules now that government controls have been removed.

So far as can be determined from a canvass of leading producing interests last week, no precipitate action is in the cards, adoption of definite policies being delayed pending clarification of the situation and considered study of all the factors involved.

As a general thing, it is expected prices will be raised on certain products which the industry long has considered underpriced, but these and possibly a few other scattered modifications will be the exception to the rule, at least in the immediate future. Conservative action is indicated all along the line with ultimate action depending upon the trend in raw material prices and labor costs.

Despite steelmakers' statements that they intend to move with caution, price developments in other metals and raw materials, especially iron and steel scrap, may force them to act more quickly than at first indicated. Steel scrap already has been upped $5 per ton and this increase will immediately add to steelmaking costs. Advances in copper, lead, zinc and tin prices announced last week also will have a bearing on steel costs. Copper was advanced 3.12½ cents per pound, lead 2.25 cents, zinc 1.25 cents and tin 18 cents per pound.

The trend in pig iron will be governed largely by developments with respect to coal, with the outcome of the current negotiations between the mine workers and the government having an important bearing on overall iron and steel pricing policy. In this connection, it is pointed out that 1½ tons of coal are required for a ton of coke and two tons of coke for a ton of pig iron.

In ferroalloys there may be some early increases in manganese alloys which were the only products in that line which had not already long been decontrolled. This in turn may result in certain revisions in alloy steel price schedules, and also may result in an increase in tool steel extras.

Most steel producers who had been granted premium prices under OPA expect to hold present schedules, at least pending clarification of the outlook in raw materials. However, one platemaker, whose premiums have been less than those granted to others, may advance prices on ordinary plate for both domestic and export account, leaving quality material unchanged.

Scattered Increases Expected

Steel producers are particularly reluctant to increase prices at this time with new wage demands in the offing. They indicate they are desirous of effecting such scattered increases as have long been warranted, but do not want to go further. But whatever action is ultimately taken it is believed that the studies of the steel pricing situation which have been under way for the OPA will be used to considerable extent in formulating policy. Also, it is said, some changes may be expected as time goes on involving the establishing of new basing points and adjustment of extra schedules. As a matter of fact it was reported last week that one producer had increased chemistry extras for alloy spring steel flats and that similar action was under consideration by other producers.

Some effort to restore normal price relationships between the various products distorted by the developments during the war can be expected. For instance, it is pointed out that the relationship between alloy and carbon steels was knocked out of kilter by the 8.2 per cent and the average $5 per ton increases, respectively, granted by OPA last spring. The $5 per

E. G. GRACE

IRVING OLDS

C. M. WHITE

LAUSON STONE

HILAND BATCHELLER

E. L. RYERSON

FRANK PURNELL

ton increase on carbon steel, it is said, was greater percentage-wise on some products than on others. Also the 8.2 per cent increase in alloy prices resulted in fractional cents in base quotations. It is believed some consideration will be given to these with a view to rounding them out to facilitate figuring quotations.

Comments of leading steel producers all reflect restraint and determination to move cautiously. Eugene G. Grace, chairman, Bethlehem Steel Corp., said:

"I am opposed to the policy of increasing costs and increasing prices because of its unsoundness in our national economy. Where efficiency exists increased costs stem largely from increased wage rates. The steel industry, in the main, has modern plants, well equipped, and its processes of production are efficient. There is no excess profit in the steel industry today resulting from the present relationship between costs and selling prices, measured on either percentage of profit on sales or percentage of profit on investment. Bethlehem hopes it will not be forced to make a general increase in steel prices and has no intention of doing so if costs remain stable.

"It naturally follows, however, that any increase in wages, either in the steel industry or in industry supplying materials to the steel industry, such as coal, is bound to increase the cost of producing steel, and, to the extent that such action takes place, prices of steel will have to be increased to reflect it.

"There are certain individual distress products which have for a long time been sold for less than cost. This situation in due time should be corrected; even though in our own case, where we are making a complete line of steel products and operate many other activities not a part of the steel industry, we have a diversification that helps our position. In certain companies, where the major portion of output is in products where there is little or no profit, they are entitled to and must obtain relief. A price structure, to be sound, must provide fair prices for each product. The vicious cycle of costs chasing prices and prices chasing costs must be stopped."

Irving S. Olds, chairman, United States Steel Corp., speaking for the various corporation subsidiaries, said he did not expect any overall increase in steel prices as a result of the removal of government controls. However, he said there doubtless will be increases on products whose costs now are equal to or above selling prices.

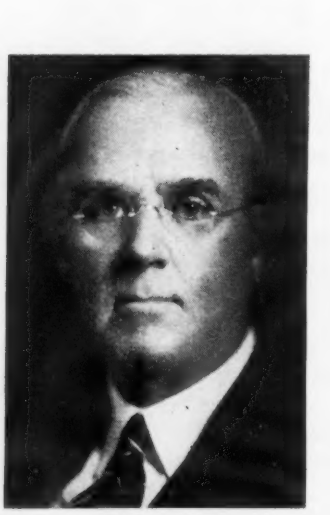
Speaking for Inland Steel Co., Edward L. Ryerson, chairman, said he would be surprised if his company took any immediate action, but stated that in the case of certain isolated commodities a price rise might be expected.

Charles S. Traer, president, Acme Steel Co., said any advances his company made would depend on what happens to prices of raw materials. A similar statement was made by Carl I. Collins, president, Superior Steel Corp., Pittsburgh, who declared there will be no immediate steel price increase unless raw material prices go up sharply.

Frank Purnell, president, Youngstown Sheet & Tube Co., Youngstown, expressed himself as feeling that the ending of price control on steel is a good thing and said: "The history of the steel business is one of conservatism. There is nothing to indicate any wild runaway in prices."

Charles M. White, president, Republic Steel Corp., Cleveland, said: "The fewer controls we have, the better off we will be and the sooner the country's economy will be straightened out."

Henry A. Roemer, chairman, Sharon Steel Corp., Sharon, Pa. said he believed lifting of controls will serve to bring



E. T. WEIR

HENRY A. ROEMER

about a better balance between supply and demand. While certain price adjustments on some steel products which have been out of line with costs will be necessary, he saw no movement in the direction of any wild inflation.

At a recent press conference, Hiland G. Batcheller, president, Allegheny Ludlum Steel Corp., Pittsburgh, said that with abolition of all price controls the probability is that the stainless steel requirements would be better met than under a controlled system.

Lauson Stone, chairman and president, Follansbee Steel Corp., Pittsburgh, said that decontrol of steel prices is not expected to result in an immediate across-the-board increase for all steel products. Rather he looks forward to some minor price adjustments for a limited number of items, which action will tend to balance out production resulting in a more normal distribution pattern from a geographical as well as product standpoint. Future level of steel prices is dependent to an extent on prospective USA-CIO wage demand settlement, and price trends of such basic raw materials as scrap and coal, he declared.

Ernest T. Weir, chairman, National Steel Corp., Pittsburgh, said the first effect of removal of price controls may be some increase in prices, but he is convinced first that this will be temporary, and second that it will not apply to all prices. He feels the country will get the production it has not got because of controls, and the buying public will get the goods it needs and wants. When production is in full swing, normal restraints of a free market will operate to bring prices into a proper balance, he said, and if production is not interrupted, this will occur in from three to six months.

T. S. Fitch, president, Washington Steel Corp., Washington, Pa., said: "Having spent two years with the government, WPB Steel Division, I am firmly persuaded that the basic law of economics will result in fairer prices and costs more surely than any system of government control."

Uniformity of Opinion Noted

Opinion of industry leaders with respect to the situation as a result of the decontrolling of prices is remarkably uniform as is shown in reports by STEEL's district editors, which follow:

Pittsburgh—Producers here appear unwilling to go out on a limb in predicting eventual action on prices. It is pointed out the industry had made an elaborate study of prices for presentation to the OPA as the basis for obtaining relief on profitless production items. Expectations are this study will to some extent provide the basis for any future action the industry may take on prices. For the moment, at least, there is unanimity of opinion that no overall increase is likely unless additional raw material and wage costs force such action. For the immediate future the aim of steelmakers will be to effect only those changes which will restore loss items to the profit side of the ledger, and restore normal price relationships between the various products.

Youngstown—Local steel executives feel that the lifting of controls will be a "good thing for both the industry and the consuming public." They believe the law of supply and demand will take care of any tendency for prices to run away. Only a few upward adjustments now are in prospect for the immediate future, it is said, though overall pricing will depend on developments with respect to raw material and wages.

Philadelphia—No general revision in steel prices is indicated in this area at this time as the result of decontrol. Increases are likely on a few products which admittedly have been underpriced under OPA regulations. Producers appear reluctant to make any unnecessary price moves with new wage demands coming up in the near future. They wish to make such scattered price advances as they long have felt were warranted, but otherwise they plan to go no further for the present at least.

Buffalo—While uniform price action was awaited following the termination of OPA controls, area firms announced that production of many items which had been halted because of unfavorable price ceilings, will be resumed almost immediately. One of the most-sought items in this group is spring wire for furniture and automobile cushions.

Chicago—Fact that the steel industry so far is holding the line on prices following the lifting of OPA ceilings indicates no runaway situation is to be expected. It is a foregone conclusion, however, certain price adjustments will be coming on a few unprofitable products. No across-the-board price increase appears likely. Base prices probably will remain unchanged, but it is not unlikely some adjustments may be made in extras.

Present, Past and Pending

■ $7½ MILLION ORDER FOR REFRIGERATOR CARS PLACED

NEW YORK—A $7½ million order for 500 refrigerator cars has been placed with American Car & Foundry Co., New York, by Railway Express Agency Inc., New York. Delivery is expected to begin in the second quarter of 1947.

■ FAIRBANKS, MORSE & CO. TO EXPAND PLANT

CHICAGO—Fairbanks, Morse & Co. has announced plans for a $625,000 addition to its Beloit, Wis., facilities for manufacture of railway diesel-electric locomotives.

■ 650-MILE CRUDE OIL PIPELINE TO BE BUILT

HOUSTON, TEX.—Construction of a 650-mile 20-inch crude oil pipeline from Corsicana, Tex., to Patoka, Ill., is planned by Magnolia Pipe Line Co., subsidiary of Socony-Vacuum Oil Co. The line is expected to be in operation early in 1948.

■ COURT ASKED TO DECIDE ON "CLEAN-UP" PAY

ATLANTA—The federal wage and hours division has asked a United States district court here to decide whether employees of the Atlantic Steel Co. should be paid for time consumed in changing clothes and washing. The government agency contends that failure to pay for the time consumed is a violation of the Fair Labor Standards Act.

■ THREE COMPANIES GET POWER EQUIPMENT CONTRACTS

WASHINGTON—Bureau of Reclamation has awarded three contracts totaling $5,737,446 for power equipment at Grand Coulee Dam. Receiving contracts were Newport News Shipbuilding & Drydock Co., Newport News, Va., Westinghouse Electric Corp., Pittsburgh, and Woodward Governor Co., Rockford, Ill.

■ CONNECTICUT ELECTRIC COMPANY SHARES PROFIT

HARTFORD, CONN.—More than a half million dollars will be shared by customers, employees and stockholders of the Hartford Electric Light Co. in a December "dividend."

■ PRICES OF SURPLUS PROPERTY TO REMAIN UNCHANGED

WASHINGTON—War Assets Administration in disposing of surplus government property will adhere to price schedules in effect before President Truman directed decontrolling of prices.

■ CRUCIBLE STEEL STARTS $30 MILLION EXPANSION

NEW YORK—Crucible Steel Co. of America is undertaking a $30 million expansion program to be completed within two years. Substantial portion of the expenditure will be for new sheet and strip rolling capacity.

Regulatory Agencies Face Sharp Cuts

OPA staff to be reduced to third former size. CPA controls to be abandoned in advance of expiration date. WSB remaining duties small

OPA's huge staff will be pared down to a corporal's guard within the next few months as result of the sweeping decontrol of prices. Above, Administrator Paul Porter addresses some 3000 of the workers, many of whom soon will be seeking other employment. NEA photo

MAJOR government control agencies are continuing in a state of suspended animation pending decisions on their final disposition.

The sweeping decontrol order issued by the President on Nov. 9 following the new "mandate" from the people on Nov. 5, foreshadowed early and drastic shrinkage of these agencies and their eventual dissolution.

Meanwhile, a considerable amount of detail remains to be cleared and certain control functions will continue to be exercised for some months.

Top executives of the control agencies, Reconversion Director John R. Steelman and officials of the Bureau of Budget are mapping the liquidation in a series of conferences in Washington.

At week's end indications were that the huge staff of the Office of Price Administration soon will shrink to a corporal's guard. OPA officials estimate that for the immediate future about 13,000 workers will be needed to administer the remaining functions of that agency. Nearly half of these will be required for the rent control program, while 2400 will be assigned to check rice and sugar price divisions. A small accounting force will be maintained. A history-writing staff will make a permanent record of everything which OPA did to affect the national economy from its formation in April, 1941. A skeleton information staff likewise will be maintained.

12,000 Remain To Be Fired

As of Oct. 15, OPA had 35,000 employees. Ten thousand dismissal notices were mailed last week as result of the pre-election decontrol of meat and other foods and the liquidation of local ration boards. This means that about 12,000 remain to be fired as result of the overall decontrol order.

The Bureau of the Budget, it is expected, will approve a procedure for handling dismissed OPA employees gently. At least the policy of giving 30 days' notice will be maintained. OPA's employment security committee, which has been attempting to find jobs elsewhere for dismissed OPA workers, in other government agencies or private industry, has stepped up its activities. In view of the overall reduction in government bureau personnel, transfers to other government jobs are difficult to obtain.

The Wage Stabilization Board was left with three functions, following the President's termination of wage controls. One is to act in reference to wage disputes in plants seized by the government. There now are only two groups of such plants, the coal mines and the properties of the Great Lakes Towing Co. This detail, which stems from the Smith-Connally War Labor Disputes Act, has been taken care of mainly at the White House in recent months, so possibly the WSB will be relieved of it altogether.

Another remaining function is that of continuing to prosecute and obtain settlement of enforcement actions. This is important in the case of WSB because that agency has made many certifications to the Collector of Internal Revenue to the effect that payroll expenditures of certain violators were nondeductible for income tax purposes. So that the income tax collector can keep his books in order it will be necessary to settle all these cases as quickly as possible. Present thinking at the WSB is that it may be advisable to assess cash penalties in lieu of declaring payroll expenses as nondeductible. For instance, where a violator has been barred from deducting a $100,000 payroll item from his income tax return, some advantage is seen in levying a cash penalty of, say, $10,000 instead.

It is expected that a small staff will be set up to write the history of the War Labor Board and the Wage Stabilization Board, mainly for purposes of reference in case of another national emergency. Also, a small information staff will stay in existence for a time.

Steel Commission To Continue

In addition the Steel Commission which was established by the old War Labor Board to iron out wage rate inequities in the steel industry is to continue with its work.

There will be no change in the operation of the program authorized by the Veterans Emergency Housing Act of 1946 under which the RFC, by directives from the national housing expediter, pays premiums for the purpose of encouraging production of materials needed in building construction.

However, the premiums as now set were established on the basis of OPA ceiling prices. Now that all raw materials

and labor are again in a free market the present premiums may have to be refigured. This will depend on price developments in iron ore, coal and many other materials. If there are substantial price increases Expediter Wilson Wyatt might do one of two things. He might authorize increases in the present premiums. Or he might decide that the situation in building materials is easier, in which event he would not exert pressure to keep premium-financed production going.

The present premium programs in the field of metals are the following:

Pig iron: The premiums are paid for above-quota production of foundry and malleable iron. Premiums are $8 per ton to producing plants and $12 to closed plants whose operation is to be resumed. Agreements made provide for payment of the $8 premium in the case of the Republic furnace at Troy and an Inland furnace at East Chicago, and the $12 premium in the case of the Mystic furnace at Everett and the Republic furnace at Gadsden. Expiration date for the premium arrangements on pig iron is June 30, 1947.

Nails: Premium A is $20 a ton and is paid for above-quota production of housing nails. Premium B is $7.50 a ton for nail rods and is paid on sales by integrated mills to nonintegrated producers of nails. Expiration date for these premiums is March 31, 1947.

Cast iron soil pipe: Premiums are $40 a ton for Saturday production and $10 a ton for above-quota production. Expiration date is June 30, 1947.

Convectors — Hot-air pipes made of galvanized sheets: Premium is 10 cents per square foot for above-quota production. Expiration date is Dec. 31, 1947.

Galvanized and plain carbon steel sheets: While the premiums will be retroactively effective as of Nov. 1, they have not yet been determined. The expiration date has been set tentatively for June 30, 1947.

Above premiums all are paid in accordance with agreements reached with individual producers. While there has been some talk in recent months of extending premium arrangements to still other steel products it now is considered unlikely the present list will be enlarged.

Although the President's decontrol order did not affect the status of the Civilian Production Administration, that agency is expected to wind up most of its controls soon. If, as the President said, supply and demand are so nearly approaching balance that price controls are no longer needed, then it follows that priorities assistance no longer is needed.

Last week the CPA still had 46 priority, inventory control, allocation and other orders on its books. By Dec. 15 this number is expected to be reduced to 25 or 30. The majority of the remaining orders, STEEL was informed, will be eliminated long before the CPA expiration date of March 31, 1947.

Future of M-21 in Controversy

CPA officials and Housing Administrator Wyatt last week were engaged in a controversy over the future of M-21, key control order for the iron and steel industry since September, 1941. CPA believes the time has come to discard M-21. The housing expediter wants the order continued.

No further use of subsidies in the purchase of steel to encourage production of scarce finished steel products will be ordered by CPA. In the summer, it will be recalled, RFC, under a CPA directive, purchased a substantial quantity of sheet bars from Jones & Laughlin Steel Corp. and Sharon Steel Corp. for shipment to a number of nonintegrated sheet producers. Some of this tonnage still is to be shipped and when the orders have been filled they will not be renewed. The sheet situation, apparently, now has improved sufficiently to prevent continued use of the subsidies to encourage production.

Present indications are that such priority controls as may remain on building materials will be passed over to the National Housing Administration at the end of the year. By that time, it is hoped, there will be no further need for priority controls in industry in general.

CPA REGULATIONS

Tank Cars: Two major tank car builders, American Car & Foundry Co. and General American Transportation Corp., have been directed to give precedence during December and January in manufacturing 100 high-pressure anhydrous ammonia and 200 liquefied petroleum cars and 118 anhydrous ammonia and 72 liquefied petroleum cars, respectively. Both of these firms must give scheduling preference during February and March to the production of the liquefied petroleum cars to the limit of their capacity, or around 400 units. (M-293; CPA-LD-398)

Alkalies: Sodium carbonate (soda ash), sodium sesquicarbonate, sodium bicarbonate, sodium hydroxide, sodium silicates and sodium phosphates no longer may be obtained through priority assistance to begin or expand operations or maintain present production levels. "CC" ratings for alkalies will be assigned only in case of emergency, or of deliberate inequity of distribution among established consumers, or for the production of critical products in accordance with schedule 1 of PR-28. (PR-28; CPA-LD-399)

Motors: Any owner, occupant or builder of a housing accommodation who is unable to obtain a blower motor for a forced warm-air furnace which was installed without a motor may certify in writing to his furnace supplier that the housing accommodation is occupied or ready for immediate occupancy but will not be habitable without a blower motor. The supplier must treat this certificate as if it were a rated order, and either fill it or pass it on through regular trade channels until it is filled. (PR-33; CPA-LD-400)

Steelworkers Will Ask Wage Raise From U. S. Steel

Demands will be presented Jan. 15. Portal-to-portal pay and insurance also included. Coal negotiations continue

NEW wage demands will be presented by the United Steelworkers of America-CIO to the United States Steel Corp. next Jan. 15. This was the word passed out by union officials last week as they prepared to move into Atlantic City over the week-end for a meeting of the steelworkers' executive committee, which will precede the CIO convention.

The discussion of a new contract with U. S. Steel is expected to set the pace for the other companies in the industry, as it so often has in the past.

Amount of the wage increases to be asked have not yet been announced, although some union leaders have intimated the figure will be about 25 cents an hour. The amount of the increase probably will be influenced by the outcome of the soft coal negotiations now underway in Washington.

In addition to a wage increase, the steelworkers are expected to ask:

1. Shorter work days, if production starts to drop. The idea, of course, would be to spread the work. Some union officials mention a 6-hour day.

2. Group health, accident and life insurance paid for by the company. The union believes it has a better chance of obtaining this than a welfare fund such as granted the soft coal miners when the government seized the coal mines and which is collected through a 5-cent-a-ton royalty.

3. Portal-to-portal pay. Union will ask that the workers be paid from the time they enter employer's premises and possibly that time clocks be installed at entrances.

Pending opening of new wage negotiations in the steel and metalworking industries, the discussions between Secretary of Interior J. A. Krug and John L. Lewis of the United Mine Workers are being watched closely. Last week, Krug appealed to the mine owners to negotiate a new agreement with Lewis that would permit the government to get out from under operation of the mines. The operators were unwilling to enter such negotiations until Lewis makes known his demands, which he had not done late last week.

Guaranteed Wage Issue Discussed At National Founders Convention

Speaker tells delegates to forty-ninth annual meeting that next Congress will face administrative pressure to legislate government financial assistance to industry in lean periods upon adoption of a guaranteed annual wage plan

THE GUARANTEED annual wage issue will loom large over coming months, O. C. Cool, director, Labor Relations Institute, told members of the National Founders Association at their forty-ninth annual convention at the Waldorf Astoria, New York, Nov. 7-8.

Management-labor problems dominated discussions throughout the meeting. However, broad economic aspects of industry and business came in for important attention, with no little interest displayed in the prospect of legislative changes in light of the recent sweeping Republican victory.

I. R. Wagner, president, Electric Steel Castings Co., Indianapolis, was elected president, succeeding Herman Menck, vice president, Harnischfeger Corp., Milwaukee. Franklin Farrell III, vice president, Farrel-Birmingham Co. Inc., Ansonia, Conn., was elected vice president.

The next Congress, Mr. Cool declared, will be faced with administrative pressure for legislation whereby employers can be financed through lean sales periods by government loans upon adoption of a guaranteed wage plan. Should such legislation go through, management, he said, would be confronted with serious problems, for if the position of an employer does not permit adoption of an annual wage plan, particularly if he is not in position to finance the accumulation of a large inventory, government loans would be pressed upon him.

Government Control Involved

Referring to the possibility of government financing, Mr. Cool said: "I doubt if it is necessary to point out the evils of such a gigantic undertaking—you realize that such a plan would surely involve some government control of your business—of each and every industry. However fantastic this might sound to you and industrial management in general, on a national basis, the politicians—labor and government—are today getting their ammunition ready for a battle which they hope will have a strong bearing on the 1948 presidential election."

Mr. Cool said labor leaders are concerned over the recent turn in the political outlook and will probably avoid prolonged strikes. "They are afraid not only of serious losses in membership from long strikes, but of the possibility of restrictive legislation from a new Congress." The speaker added, however, that because of important increases in the cost of living, employers should be prepared to offer some kind of a compromise on the "second wave" of wage increase demands now in prospect.

Threatened with retroactive action under the Wage-Hour Act which may run into many millions of dollars, industry engaged in interstate commerce was urged by Mr. Cool to do two things: First, avoid making any commitments to unions on the matter, and second, immediately obtain proper and full information on the requirements of the Wage-Hour law with respect to payment for non-productive time spent by employees on company property.

Court Decision Holds Threat

He said interpretations of the Supreme Court decision on the issue of portal-to-portal pay as expressed in the Mt. Clemens Pottery case "is a sword of Damocles in labor relations that threatens dire economic consequences for businessmen everywhere engaged in interstate commerce."

Big industry, he said, is particularly worried about this new development, its possible effects upon long-awaited expansion and improvement programs and its financial structure.

The problem of foremen unionization transcends all others in the management-labor category, Gerard D. Reilly, former member, National Labor Relations Board, Washington, D. C., declared. Subjecting foremen to the discipline of labor organization will ultimately mean that labor unions will become virtually independent contractors of industrial production.

Mr. Reilly proposed seven recommendations for improving existing management-labor relations: (1) Confine the labor board to judicial functions and free members of the board from certain administrative duties; (2) make sure that orders of the board are respected by labor organizations as well as by employers; (3) provide for relief against unions which refuse to process or to transport goods made by non-approved employers; (4) provide for improved review of illegal strikes; (5) provide for improvement of handling jurisdictional strikes; (6) broaden the right of petition to the board to include employers as well as unions; and (7) increase recognition of the employers' right of free speech, except where threats of economic reprisals occur.

I. R. WAGNER

Cecil B. Dickson, chief, Washington Bureau, Gannett News Service, Washington, declared there is considerable talk of compulsory arbitration coming up for action in the next Congress. He warned management, however, to consider carefully any such support as they may give to such legislation, pointing out that once compulsory arbitration is written into law, it will apply to employers as well as to employees.

He looked for the new Republican Congress to abolish government interference with results of collective bargaining; to enforce labor contracts on both sides; to insist upon a compulsory cooling off period in labor disputes; to prohibit secondary boycotts; and to establish fact finding boards in utility disputes. He thought Congress would oppose collective bargaining rights for foremen; insist on wider injunctions in labor disputes.

Business is going to have six years to help restore the American way of life, Owen Brewster, United States senator, Dexter, Me., declared. "The hour-glass is set," he said; there will be two years under the present federal administration, and four years under a Republican administration. Of this much at least he was

certain. But if the objective is not obtained by that time, it may be too late.

Asserting that "self-help" by employers was preferable to political action in restoring a balance of power in management-labor relationships, Stuart S. Ball, secretary and counsel, Montgomery Ward & Co., Chicago, urged employers to fight for their rights. Discussing various available measures of redress, he said they include the suability of labor unions for breaches of contract or for damages due to illegal actions; redress against violence on the picket line; making employees assume the risk and share the economic consequences of a strike; and redress against libels and employers' rights of free speech.

Discussing trends of modern employee recreation programs, C. E. Brewer, National Recreation Association, New York, said the disposition was away from management paternalism, with all the money coming from management and dominated by management. Activities should be as self-supporting as possible. He also said that the trend was away from the expenditure of large sums for plant-owned athletic fields and buildings. It is better for workers to use community facilities and engage in activities in the community in which they live.

Dr. H. A. Vonachen, medical director, Caterpillar Tractor Co., Peoria, Ill., discussed the responsibilities of the plant supervisor and what is necessary to his being a capable supervisor. He also discussed the problems confronting a doctor in a large industrial organization.

The association passed a resolution calling for repeal of the National Labor Relations Act.

MEETINGS . . .

Nov. 18-22, National Metal Congress and Exposition, Municipal Auditorium, Atlantic City, N. J. Concurrent joint meetings of the American Society for Metals, Iron & Steel and Institute of Metals divisions, American Institute of Mining & Metallurgical Engineers, American Welding Society, and the American Industrial Radium & X-Ray Society.

Nov. 21-22, Regional Foundry Conference, sponsored by the Chicago and Central Illinois chapters, American Foundrymen's Association, Hotel Continental, Chicago.

Nov. 22-23, American Zinc Institute: Fall meeting, Galvanizers Committee, Stevens Hotel, Chicago. Headquarters are at 60 East 42nd St., New York 17.

Nov. 24-26, National Auto Wreckers Association: Annual convention, Congress Hotel, Chicago. Headquarters are at 624 S. Michigan Ave., Chicago 5.

Nov. 25-26, Packaging Institute: Annual meeting, Hotel Stevens, Chicago. Institute headquarters are at 342 Madison Ave., New York.

Dec. 2-4, Society of Automotive Engineers: National air transport engineering meeting, Edgewater Beach Hotel, Chicago. John A. C. Warner, 29 West 39th St., New York 18, secretary and general manager.

Auto Manufacturer Expects Easier Flow of Flat-Rolled Steel by January

Packard president reveals plans to step up production by 30 per cent by end of first quarter. Increase, translated to industry basis, would mean 520,000 cars and trucks monthly compared with present output of about 400,000

DETROIT

ANTICIPATING substantial increase in the movement of sheet and strip steel to automotive plants by January at the latest, Packard Motor Car Co. already has started to "bite into" its 45-day float of steel, and will reduce stocks thereby to the extent of 1200 tons this month, according to George T. Christopher, president.

It is expected that by March 1 of next year it will be possible to step up automobile assembly rates by 30 per cent as a result of the improved steel supply, which would mean 520,000 cars and trucks monthly for the industry, as against about 400,000 currently. Packard inventories of basic materials other than steel are considerably better than 45 days supply, some as much as four months.

Despite the fact a new series of models has been completely tooled for production there will be no changeover at Packard until some time in 1947, for two principal reasons: Inventory commitments and unwillingness to close operations for the 30 days required to make the shift. Mr. Christopher said new models would "mark a real jump in their further development of current trends," and added it was the plan to include a new type of automatic transmission, developed by Packard, in their design.

Exceeds Break-Even Point

Break-even point in Packard operations under present conditions is 6500 cars monthly, a level exceeded for the first time in October when production totaled 6728. The plant has a full single-shift capacity of around 8700 cars monthly, a double-shift peak of better than 13,000. Bodies are supplied by Briggs which has capacity for 70 per hour or practically the equivalent of Packard peak assembly capacity.

Efficiency of the Packard working force at the present time is estimated at around 75 per cent of the prewar level. Average hourly rate of pay is $1.38 which, on the basis of efficiency, can be converted to a labor cost to the company of $1.73 per hour.

The company has appropriated $20 million for reconversion and plant expansion, plus tooling for new models. About 65 per cent of this total already has been expended.

On the question of union demands for higher wages in the automotive industry, Mr. Christopher said that if working people are actually dissatisfied with present earnings he cannot understand why absenteeism continues double the wartime rate and why working forces refuse to put in overtime regardless of premium rates.

Daily output of 9000 cars and trucks is the production schedule of General Motors divisions over the next five months, according to C. E. Wilson, president, speaking in Flint, Mich. He said this figure is 80 per cent of rated capacity of present plants, and a 5 per cent increase over October schedules. It is 2300 units under the prewar peak.

To reach this planned level will require, monthly, 156,000 tons of sheet and strip, 72,000 tons of other steel, 27,500 gross tons of pig iron, 9,365,000 pounds of copper, 5,560,000 pounds of lead and 4,550,000 pounds of zinc.

Calling upon executives of business and industry to discard the word "management" in favor of "leadership," E. R. Breech, executive vice president of Ford Motor Co., in an address last Thursday before the Jefferson City, Mo., Chamber of Commerce, declared there is too much isolation in business and industrial managements today. He urged businessmen to spend more time—5 per cent at least—in working with people at all levels in government in the interests of maintaining the American competitive profit and loss system.

In his first public address since assuming the Ford post, Breech also disclosed his company lost $51,600,000 in the first nine months of the year, despite two price increases, one in March and one in May. A third price increase was authorized by OPA late in September but had little effect in reducing losses. The total is figured before tax carrybacks which cannot be determined accurately until results of the full year's operations are known. Had the loss represented a full year's results, the tax carryback would have reduced it only to $32,900,000.

Construction Taking More Steel; Auto Industry Holds First Place

Containers slip back to third place in June, but remain in second for first half year. Heavy wartime consumers—shipbuilding, aircraft, ordnance and other military—now receiving small tonnages

CONSTRUCTION moved into second place as a consumer of finished steel in June, displacing the container industry, according to figures compiled by the American Iron & Steel Institute. Building and maintenance received 364,082 net tons during the month, almost 10 per cent of total finished steel shipments of 3,706,172 tons.

First place among consuming industries continued to be held by the automotive industry which received 402,491 tons, or 10.8 per cent of the total.

Distribution by warehouses dropped slightly from the level of the first five months, to 17 per cent of the total, or 629,771 tons. For the first half of the year warehouses received nearly 20 per cent of total finished steel shipments.

For the first six months of the year, consuming industries rank in order of tonnage taken: 1—Automotive; 2—containers; 3—construction and maintenance; 4—rail transportation; 5—machinery, industrial equipment and tools; 6—contractors' products; 7—domestic and commercial equipment other than appliances, utensils and cutlery; 8—appliances, utensils and cutlery; 9—electrical machinery and equipment; 10—agricultural equipment.

These classifications exclude shipments to warehouses, to converters and processors and exports.

Far down the list are the big wartime consuming classifications. During the first half year, less than 22,000 tons went into ordnance and other military. Aircraft required only 10,326 tons, and shipbuilding, the wartime No. 1 consumer, used only 110,609 tons.

Accompanying table shows shipment of leading products by market classifications, all grades of steel, including alloy and stainless.

October Ingot Output Sets Peacetime High

Totals nearly 7 million tons with operations averaging highest since May, 1945. Year's total to exceed 68 million tons

OCTOBER production of steel ingots was record-breaking for peacetime, the American Iron & Steel Institute reported last week.

Output for the month totaled 6,970,235 net tons, a sharp gain compared with production of 6,517,894 tons in the preceding month. It exceeded production in October, 1945, by an even larger margin, output in the latter month amounting to 5,596,776 net tons.

Ingot operations averaged 89.3 per cent of capacity in October, highest for any month since May, 1945. In September the ingot rate averaged 86.4 per cent, and in October, 1945, the rate was 69 per cent.

October was the fourth successive month this year in which steel production exceeded 6,500,000 tons. Immediately after settlement of the coal strike in the spring the industry quickly stepped up operations and has held output on a high level throughout the summer and into the fall.

Shortage Blamed on Strikes

In the first 10 months of this year production totaled 54,313,814 net tons. This was down sharply from production of 67,443,221 tons in the corresponding period of 1945, the drop being due to the loss of output in the first half of the year occasioned by the steel and coal strikes. Steel men estimate this lost tonnage exceeds at least 12 million tons and are of the opinion that had it been available for the market the supply shortage felt all year long would not have been nearly as severe as it has been.

Indications now are that production for 1946 will set a new peacetime record in steel. In event the October output rate of 6,970,235 tons is maintained through November and December, total production for the year will exceed 68 million

Distribution of Steel Consuming Industries—First Half, 1946

Market Classification	Shapes	Plates	Hot-Rolled Bars	Cold-Finished Bars	Seamless Tubing	Drawn Wire	Hot-Rolled Sheets	Cold-Rolled Sheets	Coated Sheets	Hot-Rolled Strip	Cold-Rolled Strip	Total (All Products
Converting and Processing	9,726	127,490	766,934	51,376	39,507	321,662	211,448	16,762	5,647	122,295	42,394	1,646,876
Jobbers, Dealers, Distributors	342,758	266,623	436,750	224 521	395,915	61,197	358,606	221,092	206,023	43,961	22,760	3,911,382
Construction, Maintenance	641,397	354,877	112,811	1,501	117.617	11,292	120,748	20,973	73,222	30,357	4,153	1,880,363
Contractors' Products	2,397	23,421	42,324	4,238	12 250	9,184	199,330	111,004	107,215	24,207	20,550	614,924
Automotive, excl. Tractors	10 142	87,328	352.218	88,560	3,656	52.414	584 246	575,673	34,491	153,834	91,735	2,130,148
Rail Transportation	114,795	242,857	137,794	2,705	1,601	2,725	56,572	5,440	15,025	16,314	2,657	1,467,225
Shipbuilding	17,907	66,685	8,698	826	667	875	5,228	2,240	3,575	451	133	110,609
Aircraft		791	698	1,602	694	212	1,303	934	649	685	853	10,326
Oil, Gas Drilling	4,926	18,294	19,001	2,169	15,388	129	1,938	22	21	49	90	91,717
Mining, Quarrying, Lumbering	4,867	13,960	17,870	1,046	265	844	6,737	1,175	404	1,179	88	73,332
Agricultural	13,710	27,837	166,793	25,575	894	10,976	54,910	12,627	49,278	34,925	2,126	429,436
Machinery, Indus. Equip., Tools	59,551	182,687	226,342	100,923	35 203	26,454	82,286	25,006	6,160	36,086	27,122	901,221
Elect. Mach., Equip.	7,932	30,744	42,791	19,446	249	11,511	88,059	42,523	16,836	24,029	19,718	470,388
Appliances, Utensils, Cutlery	108	3,176	6,394	15,819	1,842	12,985	85,582	240,204	31,438	17,225	39,613	553,898
Other Domestic, Commercial Equipment	1,714	19,682	28,165	20,967	742	93,036	98,838	154,443	23,344	28,408	55,923	578,990
Containers	47	57,437	8,724	28		32,919	259,742	104,217	16,511	55,959	37,047	1,901,778
Ordnance, Other Military	805	757	3 891	668	35	516	2,483	2,149	238	1,277	1,134	21,994
Unclassified	105,152	96,461	490,467	85,422	103,265	197,045	128,048	104,068	28,146	27,318	215,470	2,352,121
Export	81,753	115,750	69,910	6,535	43,256	29,004	82,491	62,650	31,009	25,686	6,376	1,139,130
Total	1,419,687	1,736,857	2,938,575	653,927	773,044	874,980	2,428,595	1,703,202	649,232	644,245	589,942	20,285,853

tons by a comfortable margin.

Chiefly because of the shorter month shipments of steel products during September were down as compared with the preceding month. Total movement for the period is reported by the American Iron & Steel Institute at 4,994,377 net tons, representing 86.5 per cent of effective finishing capacity. In August shipments had amounted to 5,406,470 tons, representing 90.4 per cent of effective capacity. In September, 1945, the shipments were reported at 4,391,143 tons, representing 71.6 per cent of capacity.

Declines were reported in every product category except rerolled billets, nails and staples, and bale ties, and the gains in these were only minor, the institute pointed out.

Shipments in the first nine months this year totaled 37,150,548 net tons, representing 71.1 per cent of effective finishing capacity. This was a decline compared with shipments of 48,080,687 tons, or 86.8 per cent of finishing capacity in the first nine months of 1945. The loss in shipments was almost entirely due to the strikes in the early part of the year.

Machinery and Tool Market Only Slightly Affected by Decontrol

Trade has been operating in virtually "free" market for months past. Builders failed to take full advantage of increase in ceiling prices allowed by OPA some time ago. Government surplus machinery disposal plan criticized

LITTLE change in machine tool and machinery market conditions are indicated as a result of the fading out of government price control. For all practical purposes the machinery lines have been in a "free" market for some months past as a result of the action of OPA in allowing substantial price increases. In only a few instances were prices raised to the new ceilings allowed by OPA.

Various factors contributed to this conservative policy. For one thing demand for tools has been below the capacity of the industry to produce. At the same time shipments are down markedly from a year ago, while competition from government surplus equipment serves to discourage price levels which might drive machinery buyers from the new tool and equipment market.

In this latter regard, only recently the government surplus disposal agency adopted a so-called "fixed-price" plan which seriously threatens to disrupt the market. By this action the government agency reduced prices on approximately 60 per cent of the surplus tools to the point they are available to buyers 64 to 80 per cent below original cost. Some of these surplus tools, it is feared, will get into the hands of speculators.

Moderate Increases Expected On Electrical Equipment

L. E. Osborne, Sr., operating vice president, Westinghouse Electric Corp., Pittsburgh, last week said decontrol will mean some moderate increases in the price of certain lines of electrical products within the near future.

"Westinghouse, however, recognizes the necessity of keeping prices as low as possible," he said. "Our manufacturing operations are geared to mass production. That in turn depends upon mass consumption of goods at competitive prices which are low enough to be attractive.

"In our opinion, decontrol will be an important factor in relieving the present shortage of vital materials, which is one of the biggest obstacles to full production. Suppliers of many controlled items have found it impossible to meet costs in the past.

"Specifically, the decontrol of steel will greatly help in getting a more nearly equitable distribution and will aid those companies producing products valuable to our economy to get steel. Decontrol of nonferrous metals, particularly copper, will be effective to the extent it becomes profitable to operate marginal mines. Americans must pay enough to make it worth-while to operate our domestic mines and the price also must be equal to or a little higher than the world market price to increase the flow of import copper to our industries. Chief obstacle is the 4-cent a pound import duty on all foreign copper. Removal of this duty would do much to increase copper imports."

STEEL INGOT PRODUCTION STATISTICS

Based on reports by companies which in 1944 made 97.6% of the open hearth, 100% of the bessemer and 85.8% of the electric ingot and steel for castings production

	Estimated Production—All Companies									
	—Open Hearth—		—Bessemer—		—Electric—		—Total—		Calculated weekly production all companies	Number of weeks
1946	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	in mo.
Jan.	3,528,090	51.1	207,512	47.4	136,452	29.2	3,872,054	49.6	874,053	4.43
Feb.	1,300,944	20.9	25,905	6.6	65,668	15.6	1,392,517	19.8	348,129	4.00
March	5,946,698	86.2	363,949	83.1	196,400	42.0	6,507,047	83.3	1,468,859	4.43
1st qtr.	10,775,732	53.8	597,366	47.0	398,520	29.4	11,771,618	51.9	915,367	12.86
Apr.	5,333,139	79.8	286,088	67.5	241,031	53.3	5,860,258	77.5	1,366,028	4.29
May	3,699,979	53.6	153,409	35.0	219,064	46.9	4,072,452	52.2	919,289	4.43
June	5,145,594	77.0	251,253	59.2	227,979	50.4	5,624,826	74.4	1,311,148	4.29
2nd qtr.	14,178,712	69.9	690,750	53.7	688,074	50.1	15,557,536	67.9	1,195,814	13.01
1st 6 mos.	24,954,444	61.9	1,288,116	50.4	1,086,594	39.8	27,329,154	59.9	1,056,403	25.87
July	6,016,253	87.4	365,332	83.6	228,083	48.9	6,609,668	84.9	1,495,400	4.42
Aug.	6,251,271	90.6	373,837	85.4	261,755	56.0	6,886,863	88.2	1,554,597	4.43
Sept.	5,911,375	88.6	371,465	87.8	235,054	52.1	6,517,894	86.4	1,522,872	4.28
3rd qtr.	18,178,899	88.9	1,110,634	85.6	724,892	52.3	20,014,425	86.5	1,524,328	13.13
9 mos.	43,133,343	71.0	2,398,750	62 2	1,811,486	44.0	47,343,579	68.9	1,213,938	39.00
Oct.	6,344,089	91.9	387,933	88.6	238,213	51.0	6,970,235	89.3	1,573,416	4.43
1945										
Jan.	6,469,340	90.5	379,062	76.0	355,910	76.8	7,204,312	88.8	1,626,256	4.43
Feb.	5,968,326	92.4	347,227	77.1	337,212	80.6	6,652,765	90.8	1,663,191	4.00
Mar.	6,927,939	96.9	398,351	79.8	379,639	81.9	7,705,929	95.0	1,739,487	4.43
1st qtr.	19,365,605	93.3	1,124,640	77.6	1,072,761	79.7	21,563,006	91.5	1,676,750	12.86
Apr.	6,541,627	94.5	372,952	77.2	375,308	83.6	7,289,887	92.8	1,699,274	4.29
May	6,664,117	93.2	402,100	80.6	383,450	82.7	7,449,667	91.8	1,681,640	4.43
June	6,129,763	88.5	379,807	78.6	330,952	73.7	6,840,522	87.1	1,594,527	4.29
2nd qtr.	19,335,507	92.1	1,154,859	78.8	1,089,710	80.0	21,580,076	90.6	1,658,730	13.01
1st 6 mos.	38,701,112	92.7	2,279,499	78.2	2,162,471	79.9	43,143,082	91.0	1,667,688	25.87
July	6,318,975	88.6	381,832	76.7	284,764	61.6	6,985,571	86.3	1,580,446	4.42
Aug.	5,172,344	72.3	347,088	69.5	215,885	46.6	5,735,317	70.7	1,294,654	4.43
Sept.	5,435,799	78.7	352,847	73.2	193,829	43.3	5,982,475	76.3	1,397,775	4.28
3rd qtr.	16,927,118	79.9	1,081,767	73.1	694,478	50.5	18,703,363	77.8	1,424,475	13.13
9 mos.	55,628,230	88.4	3,361,266	76.5	2,856,949	70.0	61,846,445	86.6	1,585,806	39.00
Oct.	5,146,787	72.0	242,122	48.5	207,867	44.8	5,596,776	69.0	1,263,381	4.43
Nov.	5,641,308	81.5	358,664	74.2	200,494	44.7	6,200,466	78.9	1,445,330	4.29
Dec.	5,523,277	77.4	343,266	68.9	191,394	41.4	6,057,937	74.8	1,370,574	4.42
4th qtr.	16,311,372	76.9	944,052	63.8	599,755	43.6	17,855,179	74.2	1,358,842	13.14
2d 6 mos.	33,238,490	78.4	2,025,819	68.5	1,294,233	47.1	36,558,542	76.0	1,391,646	26.27
Total	71,939,602	85.5	4,305,318	73.3	3,456,704	63.4	79,701,624	83.5	1,528,608	52.14

For 1945 percentages are calculated on weekly capacities of 1,614,338 net tons of open hearth, 112,658 tons of bessemer and 104,640 tons of electric ingots and steel for castings, total 1,831,636 tons; based on annual capacities as of Jan. 1, 1945 as follows: Open hearth 84,171,500 net tons, bessemer 5,874,000 tons, electric 5,455,890 tons.

For 1946 percentages are calculated on weekly capacities of 1,558,041 net tons open hearth, 98,849 net tons bessemer and 105,491 net tons electric ingots and steel for castings, total 1,762,381 net tons; based on annual capacities as of Jan. 1, 1946, as follows: Open hearth 81,236,250 net tons, bessemer 5,154,000 net tons, electric 5,500,290 net tons, total 91,890,540 net tons.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Republican proposal to trim personal income taxes, balance the federal budget and reduce government expenditures considered feasible and possible of being carried out. Some Democrats concur, pointing out such a program was planned for 1947

CONSENSUS of Washington fiscal authorities is that the Republican promises to: 1—Reduce personal income taxes, 2—balance the federal budget, and 3—reduce government expenditures, are feasible and can be carried out. Even loyal Democrats concur in this opinion. They add some sort of program of this nature would have materialized in 1947 had the Democrats continued in control.

So when word was received from Chicago that Senator Taft had told a press conference there that the federal budget —now $41.5 billion for the fiscal year ending next June 30—would be trimmed down to somewhere between $25 and $30 billion the only question was whether the senator in his immediate post-election enthusiasm might not have exaggerated the possibilities somewhat. The view among Treasury and Capitol Hill experts is that a cut to $30 billion should be in the cards, but that a cut to $25 billion might force some unwise reductions here and there.

The $14.5 billion budget for the current year includes many items of a non-recurring character. For instance, the military budget of $18 billion includes $3 billion of mustering-out pay which will not be duplicated. It includes about half a billion for occupation expenses which may be reduced by next year, also many additional millions for non-recurring construction in Japan and Germany, and for guarding and handling of surplus goods which have been sold or will be sold before year's end. It includes expenses of a good many war agencies which will go out of existence by next June 30 or earlier. It includes big tax carrybacks which will not recur. It includes many war contract settlements running to high figures. It also includes some large sums to be loaned to foreign governments or to be paid over to the international bank.

Particular gratification was afforded by Senator Taft's allowance of $10 to $12 billion for the Army and Navy. The cost of maintaining the Army and Navy in the fiscal year 1946-1947 is running around $13 billion, and while the military never likes to concede that it can get along with less money, the cut envisioned by Senator Taft can be made without serious impairment of the effectiveness of the armed forces. The real import of his statement is its positive indication that the Republicans do not intend to hamstring the Army and Navy.

On the basis of accepting the premise that the federal budget need be no higher than $30 billions for the fiscal year ending in 1948, no stretch of imagination is needed to accept Rep. Harold Knutson's contention that individual taxes can be reduced 20 per cent on 1947 income. Personal income tax payments came to $18.7 billion in the fiscal year ending June 30, 1946. Allowing for some reduction in income since that date, Mr. Knutson's 20 per cent proposal would bring a slash of around $3.5 billion.

Mr. Knutson's second proposal, to do away with excise taxes, also is regarded as feasible.

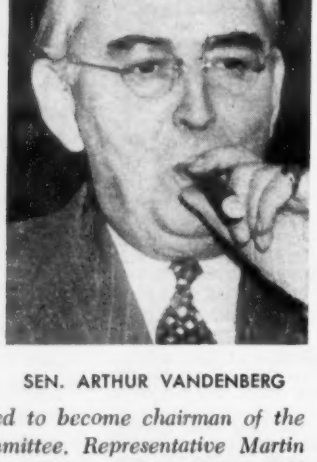
The two programs together would thus give the taxpayers relief to the extent of slightly under $4.5 billion.

Where would the rest of the budget saving go? The answer is: Much of it would go into reduction of the federal debt. Republicans in Congress never have forgotten, and never omitted a chance to boast of it, that a Republican-controlled Congress balanced the budget and in the 10 years following World War I reduced the debt by 36.5 per cent while at the same time voting four reductions in taxes. The Republican leaders in Congress are determined to go into the presidential election year of 1948 with a record for having reduced the national debt by a substantial amount.

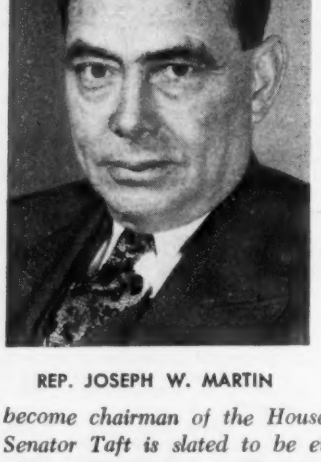
Talks with Republican spokesmen in Washington indicate little likelihood for an early reduction in corporation taxes. Corporations in the fiscal year ending June 30, 1946, paid $11.5 billion in income and excess profits taxes. Such an amount is regarded as not too large a load for business under present conditions. But the inexpediency of granting relief to corporations at a time when there is much dissatisfaction among wage earners is an equally potent factor.

Seasoned Washington observers discount the expression on both sides calling for harmonious relations between the executive and legislative branches. They think that would be contrary not only to

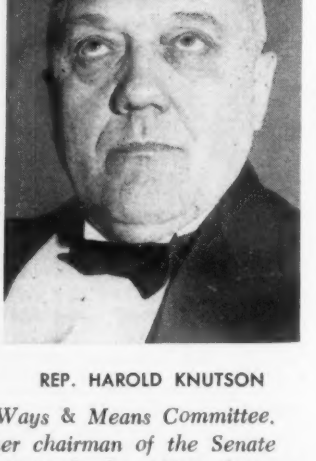
SEN. ROBERT A. TAFT



SEN. ARTHUR VANDENBERG



REP. JOSEPH W. MARTIN



REP. HAROLD KNUTSON

Senator Vandenberg is expected to become chairman of the Senate Foreign Relations Committee. Representative Martin will be Speaker of the House; Representative Knutson will become chairman of the House Ways & Means Committee. Senator Taft is slated to be either chairman of the Senate Finance Committee or Senate majority leader. NEA photos

the lessons of experience, but also to human nature. The Republicans on the hill will have in mind at all times the election year of 1948, and politics will be played on a grand scale. Washington cynics expect the Republican tactics will call for ingratiations of labor by refusing to pass strike control legislation if such action can be avoided, of the veterans by giving them substantially what they want, and of farmers by giving them additional supports as farm prices sag. There already is talk of raising the farm support level from 90 per cent of parity on most farm products and 92½ per cent on cotton to 100 per cent of parity.

Senator Taft showed the way the plans are shaping up when he said in Chicago the 1946-1947 federal budget should include $6 billions for the veterans, and "such aid as we may give" to agriculture.

Navy Training in Industry

Training of naval officers in industry, as conducted under the sponsorship of the Navy Industrial Association, has been placed on a permanent basis. Following graduation of the first class of 20 officers in September, a second class of 20 has been assigned to participating corporations.

The new class consists of younger officers of the Navy Supply Corps. They will receive, over a period of four months, a thorough background in all operational departments, including particularly the sales department, of the companies to which they are assigned.

The purpose is to provide Navy procurement officers with an intimate acquaintance with selected industries, and with an understanding of the problems and capabilities of those industries.

The companies that will furnish experience to the new class of 20 naval officers are:

Allis-Chalmers Mfg. Co., Milwaukee, Botany Worsted Mills, Passaic, N. J., Firestone Tire & Rubber Co., Akron, O., General Electric Co., Schenectady, N. Y., General Motors Corp., GMC Truck and Coach Division, Pontiac, Mich., Hercules Motors Corp., Canton, O., Marsh & McLennan Inc., New York, Moore-McCormack Lines Inc., New York, National Dairy Products Corp., Sheffield Farms Division, New York, New York Central System, New York, Radio Corp. of America, RCA Victor Division, Camden, N. J., Reichhold Chemicals Inc., Detroit, Republic Steel Corp., Cleveland, Sears, Roebuck & Co., Chicago, Socony-Vacuum Oil Co. Inc., New York, United Aircraft Corp., Stratford, Conn., Westinghouse Electric Corp., East Pittsburgh, Pa., Worthington Pump & Machinery Corp., Harrison, N. J., the Yale & Towne Mfg. Co., New York.

The companies that trained the first class of 20 Navy officers are:

Air Reduction Co., New York, Armstrong Cork Co., Lancaster, Pa., the Babcock & Wilcox Co., New York, Cannon Mills Inc., Kannapolis, N. C., E. I. du Pont de Nemours & Co., Wilmington, Del., General Cable Corp., New York, General Electric Co., Schenectady, N. Y., General Foods Corp., New York, the Goodyear Tire & Rubber Co., Akron, O., International Harvester Co., Chicago, International Paper Co., New York, Johns-Manville Sales Corp., New York, Lukens Steel Co., Coatesville, Pa., Otis Elevator Co., New York, the Pennsylvania Railroad Co., Philadelphia, Standard Brands Inc., New York, the Texas Co., New York, Union Carbide & Carbon Corp., New York, Western Electric Co., New York.

Shipbreaking Headaches

A good example of how governmental processes slow up transactions that ought to be fairly simple is afforded by the story to date of the shipbreaking program. Alarmed by the scarcity of scrap, the CPA last July launched a campaign for scrapping obsolete and damaged vessels on a wholesale scale. The aim was to get the resulting scrap to steel mill yards before the cold weather set in. To accomplish this job rapidly, surplus shipyards were to be leased to the scrap dealers for use in breaking ships.

CPA officials felt that to encourage cooperation from the scrap industry, the ships should be sold at low prices, and the yards made available at low rentals.

The matter of getting the Maritime Commission to offer ships for sale for breaking provided no difficulty, excepting that under the Surplus Property Act the commission is under the necessity of selling them at the best price developed in competitive bidding.

But the matter of leasing the shipyards for shipbreaking purposes has proven difficult. It has had the attention of a committee composed of representatives of the interested agencies—WAA, CPA, Maritime Commission, Navy and some others—and now, in November, not a single contract yet has been placed. The big obstacle is the drawing up of a form of lease contract which will protect the rights of each interested agency, and which at the same time will carry out the provisions of the Surplus Property Act.

Multiple ownership of the yards seems to have caused the most trouble. At Mobile, Ala., for example, the ways at one yard are owned by the Maritime Commission, the Navy and by the operating company, the Alabama Shipbuilding & Dry Dock Co. Other property owners are involved, as the owners of land over which the gas lines serving the yard pass. Another example is the Sun yard at Chester where title to the various facilities is held by the Sun company, the Maritime Commission, the Pennsylvania railroad, the city of Chester and some private property owners.

There also has been delay in determining the amount of rental which the scrap-breaking lessees should pay. A form of contract has been evolved which, though approved by the inter-agency committee, still lacks the necessary signatures to make it legal. As soon as this form has been legally approved, WAA spokesmen say, action should be taken immediately in leasing the Alabama yard at Mobile to the M. D. Friedman Co., Portsmouth, O., which has several ships at Mobile and is ready to take them apart as soon as it is able to use the facilities. Then with this precedent established, action should be taken quickly on leasing the other 23 yards in the program.

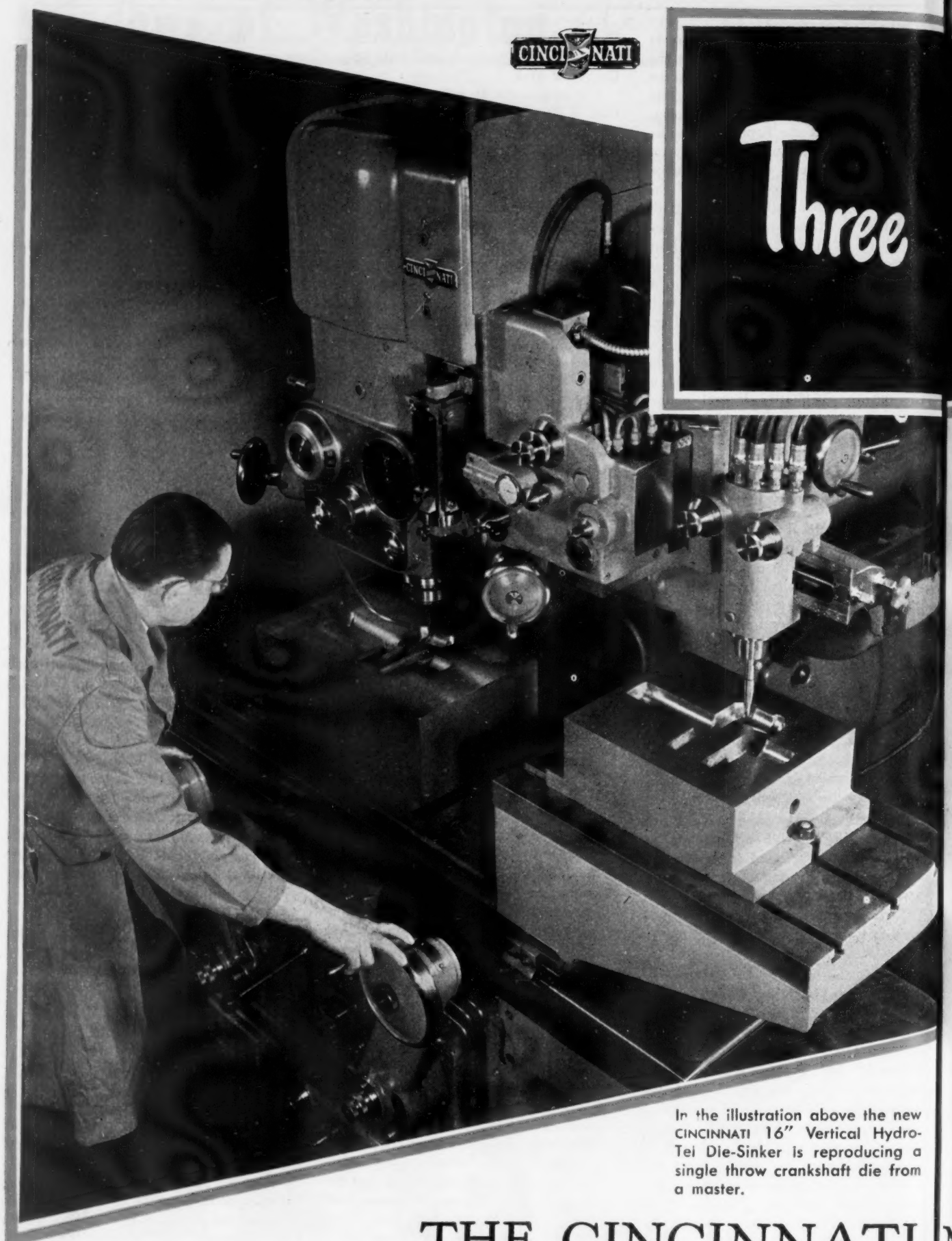
The projected form calls for establishment of rentals on the following annual basis, payable monthly in advance, for such facilities at the yard as the lessee will use in the ship breaking business: Land 1 cent per square foot, piers 10 cents per square foot, quays $3 per lineal foot, closed space 20 cents per square foot, ways $2 per lineal foot, graving docks 25 cents per square foot, drydocks $2 per ton of scrap, railroad trackage 10 cents per lineal foot along center line of track; gantry crane tracks, 20 cents per lineal foot along center line of track, cranes fixed or on tracks $25 per ton of rated capacity, other machinery and equipment 6 per cent of the installed cost to the government.

Lower Rentals Expected

The above charges are expected to yield in the average case about 3 per cent on the cost of the facilities to the government. This compares with the customary rental of 8 per cent which is charged when the yards are used for shipbuilding.

In addition to the above charges, the lessee is to pay an amount based on tonnage charges on the scrap generated at the yard. This is to be 40 cents per ton each month such payments have equalled the lessee's monthly rental. Thereupon the charge drops to 35 cents until a total amount twice that of the monthly rental has been paid in. Thereafter the charge drops to 30 cents a ton.

The contract calls for a lease not to exceed two years, and terminable by either party on notice.



In the illustration above the new CINCINNATI 16" Vertical Hydro-Tel Die-Sinker is reproducing a single throw crankshaft die from a master.

THE CINCINNATI M

MILLING MACHINES

STEEL

-way saving in Die-Sinking

ON THE

NEW CINCINNATI 16" VERTICAL HYDRO-TEL DIE-SINKER

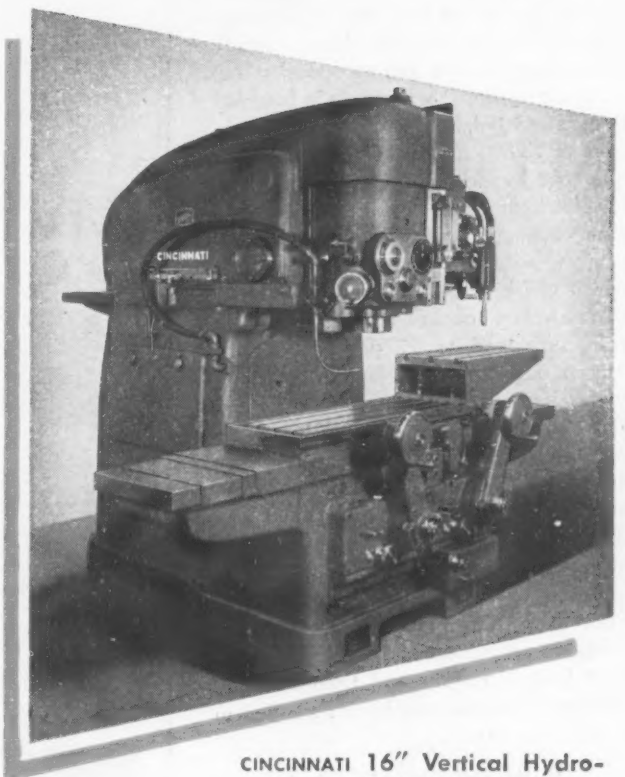
Small- to medium-sized dies and molds can be produced at a three-way saving on the new CINCINNATI 16" Vertical Hydro-Tel Die-Sinking Machine.

1) SAVES OPERATOR'S ENERGY. Convenient grouping of controls, with effortless hand Servo positioning of the table and cross slide, enables operator to easily and smoothly follow layout lines. And when templates or masters are available, the 16" Hydro-Tel *automatically* scans the impression, saving operator energy still further and relieving him of attentive alertness while the cut progresses.

2) SAVES TIME IN ROUGHING THE DIE IMPRESSION. Because of the exceptionally rugged construction of the 16" Vertical Hydro-Tel, heavy cuts can be taken, and the die impression is roughed out in half the time you might expect.

3) SAVES TIME IN HAND FINISHING. The depth control unit on these machines is exceptionally sensitive and accurate, resulting in accurate die impressions which require a minimum of hand finishing.

It will pay you to consider further the many advantages of the CINCINNATI 16" Vertical Hydro-Tel Die-Sinker for milling dies and molds of various shapes. Write for catalog M-1497. A brief description is given in Sweet's Catalog File.



CINCINNATI 16" Vertical Hydro-Tel Die-Sinker with Automatic Depth Control Unit

CINCINNATI 16" Vertical Hydro-Tel Milling Machines are available in three styles: 1) for Die-Sinking; 2) for General Purpose Milling; 3) for Automatic 360° Profiling.

MILLING MACHINE CO. CINCINNATI 9, OHIO, U. S. A.

BROACHING MACHINES • CUTTER SHARPENING MACHINES

French Coal Output Rises, Imports Fall

Belgian steelworks hit by strikes. Workers demand minimum 30½ cents an hour; are offered 30. Belgium, Holland and Luxemburg suppress customs barriers and establish common tariff, to become effective Jan. 1

PARIS

WHILE the output of coal during the latest week reached 985,000 metric tons, imports were considerably reduced. These amounted to 185,000 tons, of which 69,000 tons came from the United States, as against more than 200,000 tons in recent weeks. Consumption of electric current remained unchanged, but supply of power from hydraulic sources has decreased owing to the recent dry spell, and the thermic power houses near Paris have had to be put into use. As a result, interruptions of current have already taken place in Paris and its suburbs.

An agreement has been made between France and Belgium, and a monthly tonnage of 75,000 tons of coal will be made into coke by Belgian coke plants as from the beginning of November. By this arrangement France will receive 55,000 tons of metallurgical coke each month, which will be used for the production of an equivalent tonnage of pig iron, which will correspond to 17 per cent of the August output. The coke oven gas and by-products will be used in Belgium. This arrangement was necessitated by the fact that the capacity of French coke ovens is inadequate; at present they are capable of producing 10,500 tons per day. It is proposed to increase the coke oven installations in the steelworks to raise the capacity to 15,000 tons per day. Prior to the war France received a considerable proportion of her blast furnace coke from the Ruhr and from Holland, but now these imports have dwindled to a very low rate.

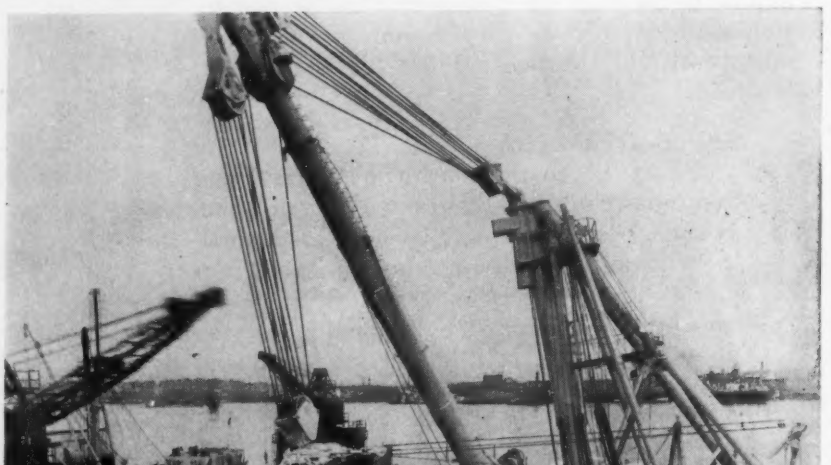
Customers' Scrap Required

In Belgium, iron and steel production is progressing favorably, due to the intensive use of scrap. Stocks have been built up in practically every steelworks and are considered sufficient for some time to come. However, it is noticeable that certain works make it a condition in accepting orders from their customers that the customer will supply at least a certain proportion of the scrap required for his order. It is feared that if this grows into a habit a black market for scrap will develop. This factor has brought about a renewed firmness in scrap prices.

The order books of Belgian works are filled, in many cases, to capacity and several makers are out of the market, particularly in regard to the domestic market. The export market is of the greatest interest to Belgium and makers share this disposition on account of the high prices that can be obtained for export sales. Finished steel products are being shipped to South America, South Africa, China, the Middle East and the Far East, as well as to those countries with which Belgium has signed commercial agreements.

An agreement has been signed between Belgian producers and rerollers allowing the bar mills to export 80 per cent of their output, and the plate and sheet mills 58 per cent. Producers have also undertaken to supply semifinished steel to the rerollers at a fixed price, subject to the tonnages available. The tonnage allowed to the domestic market for the fourth quarter of the year is at the rate of 180,000 tons per month.

Strikes have broken out in Belgian iron and steel works as workers demand wage increases. This has occurred at



LOCOMOTIVES FOR FRANCE: Motorship *Gadsden*, veteran of wartime service as a Navy assault cargo vessel but now converted to a locomotive carrier, takes on a shipment of engines and tenders for shipment to France, some of the 1400 purchased by the French government. The ship was converted at the Bethlehem Steel Co.'s Baltimore yard and can carry eighteen 125-ton locomotives with tenders as pictured

Ateliers de Construction Electrique de Liege, which employs 2000 workmen, and at the Charbonnages de Charleroi. An agreement has been arrived at by which an increase of 10 per cent has been granted, with a minimum of 1.20 Belgian francs (just under 3c) an hour and a maximum of 1.80 francs (3.2c) as margins for the increase, but some men have continued to strike as they insisted on a minimum wage of 13.50 francs (30.5c per hour) while they have been offered 13.20 (30c).

Customs barriers have been suppressed between Belgium, Holland and Luxemburg, and a common tariff will take effect Jan. 1, 1947. Figures on output of Belgian iron and steel for the first seven months of the year show a steady progression has been achieved since the beginning of 1946:—

	Pig Iron	Steel Ingots	Finished Steel
	(In metric tons)		
Jan.	141,180	149,880	119,630
Feb.	133,100	144,490	115,810
Mar.	154,300	166,090	145,470
Apr.	156,740	166,600	133,870
May	173,990	174,640	135,880
June	172,110	177,510	139,610
July	193,660	196,640	153,080
TOTAL ..	1,125,080	1,175,850	943,350

Annual reports of two large Belgian works have just been released. The Usines de la Providence has made a gross profit of 105,000,000 Belgian francs ($2,380,000); after writing off a number of items and providing for renewals and reconstruction the net profit was 67,000,000 francs ($1,520,000). Thanks to this the previous losses have been reduced to 100,000,000 francs ($2,270,000). The Esperance-Longdoz company has made sufficient profit to enable the company to amortize its previous losses and to leave a small profit of 2,700,000 francs ($61,000).

Luxemburg

In Luxemburg as in Belgium the iron and steel workers are dissatisfied with their wages. They are claiming an increase of 2 francs (4.5c) per hour, but this has been rejected by the employers' organization.

Czechoslovakia

About the middle of September the first consignment of Swedish ore arrived from the Polish port of Gdynia carrying about 6500 tons. Deliveries also came from Austria, and the position of iron ore in Czechoslovakia is gradually improving. There is a shortage of manpower in the works, which is likely to be worsened by the repatriation of Germans from Czech border towns to Germany. There are at present about 40,000 men employed in the iron and steel works. Czech exports of steel products in August amounted to 23,800 metric tons. The output of steel in August reached 133,100 metric tons.

France

The Aciéries de Longwy and the Société Lorraine Minière et Métallurgique have formed a sales organization under the name of "Longometal" with a capital of 200,000,000 francs ($1,666,666). A new rise has taken place in the price of steel scrap for open-hearth furnaces, from 950 to 1,400 francs ($7.90 to $11.65) according to grade in June, to 1,100 to 1,700 francs ($9.15 to $14.65). Iron ore prices have also risen, from 174 francs ($1.45) per ton for eastern ores with 32% iron to 280 francs ($2.35). The Société Métallurgique de Knutange, which was occupied until September, 1944, had its first blast furnace blown in in April, 1945. This concern now has two blast furnaces in operation, as against eight before the war.

Germany

Iron and steel production in the British zone reached a high mark in August. The output of pig iron rose from 164,813 tons in July to 181,104 tons in August, and the production of steel ingots from 210,321 tons to 249,846. The output of rolled products in August was 203,227 tons, against 181,200 tons in July.

Sweden

It is reported that an inquiry has been received in Bombay, India, from Sweden for 10,000 tons of pig iron.

Foreign Notes . . . .

Advices from Belfast, Ireland, have reported that a variety of new industries have either already been established or are projected for Northern Ireland. These industries include manufacture of razor blades, domestic appliances, dry cell batteries and electrical components, toys and other articles. The razor blade factory is reported to be contemplated for Dundonald, Belfast, and the others at Castlereagh.

—o—

American manufacturers are said to be scheduled to supply automatic telephone equipment for Panama City and Colon, Panama, totaling over $1,500,000, which is expected to arrive on the Isthmus by the end of this year.

—o—

Imports into Argentina in the first six months of 1946 of machinery and vehicles totaled 46,000 short tons, compared with 7000 tons for the first half of 1945, according to a report to the Department of Commerce.

—o—

Egyptian authorities are reported to be considering modification in design and specifications of the country's railroads.

—o—

Production of 320 railway cars by June, 1946, a year after the plant reopened, has been reported by the Wroolaw, Poland, Railway Car Factory. The goal is 1000 coal cars, 50 passenger cars and five tenders after three years' operations.

—o—

Spanish iron ore production for the first quarter of 1946 was 277,050 metric tons in continental Spain, and 187,620 tons in Spanish Morocco, compared with output of 262,399 tons and 163,082 tons, respectively, for the comparable period in 1945, according to a report to the Department of Commerce. Steel production during the 1946 period was 148,916 tons and pig iron production, 120,252 tons.

—o—

Installation of a new electric illuminating system at Mexico City's Central Airport has begun with arrival of materials which had been on order in the United States since 1943, according to reports from that city. The project is expected to cost about 1 million pesos. Equipment now being installed cost 250,000 pesos.

—o—

Imported railway equipment amounting to £3 million, needed for New Zealand's state railways will be purchased from United Kingdom sources. In event British manufacturers cannot meet required delivery dates, contracts will be let in the United States, it is said. Included in the equipment to be purchased are 3000 open steel railway cars and rolling stock for an electrified railway system around Wellington, N. Z.

—o—

State Department officials are reported to have approved sale to Sweden of 90 surplus Army fighter planes. Planes involved were described as being late-model Mustangs. It is understood the planes will be selected from those in France.

—o—

One of Mexico's largest firms, La Consolidada, is reported to be engaging in an expansion and diversification program which will cost approximately $5 million. The company, which fabricates steel, copper and other nonferrous metal products, is installing an integrated steel rolling mill and other steelmaking facilities.

Rollers Roll—

THROUGHOUT ALL INDUSTRY

From A to Z — automobiles to zippers. Wherever things are made, handled or transported, there you will find Hyatt Roller Bearings easing the turning of wheels and shafts.

And Hyatt Roller Bearings have for fifty-four years enabled machine designers, engineers and manufacturers to speed up production — cut maintenance costs and reduce friction to a minimum.

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HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

General Motors' action in raising prices on all models $100 analyzed. Corporation took terrific beating during 113-day strike. Claims OPA ceilings were lower than competitors'. Immediate resistance expected to be negligible

DETROIT

ALTHOUGH many may have read into General Motors' action in slapping another $100 on factory list prices of all passenger cars and light trucks a refutation of its policy of "more and better things for more and more people," a close inspection of the realities suggests the corporation could do little else, and probably was wise to make an immediate decision to clear the air, rather than chew the matter over between New York and Detroit for weeks before determining a policy.

In the first place, GM took a terrific financial beating in the 113-day strike suffered last winter. It is estimated the cost of merely keeping plants open and office forces functioning came to about $1 million per day. To this $113 million must be added the complete loss of production during the period. As for automobiles, this may have meant a loss of perhaps 650,000 units or the equivalent of possibly $75 million in operating profit.

In the second place, when the OPA determined ceiling prices of passenger cars, the formula evolved appeared to give GM competitors a distinct advantage pricewise. Ford, for example, is figured to have a $125 edge over the comparable models of Chevrolet, as against a normal disparity of only a few dollars. GM had registered a protest with the OPA, not on the basis of hardship, but simply as unfair discrimination. The $100 increase should bring Chevrolet, Buick, Pontiac, Oldsmobile and Cadillac more nearly in line with their competitors, although it must be admitted this will be a difficult point to get across to the car-buying public.

Thirdly, GM has been forced to dip heavily into working capital and reserves for the reconversion and expansion of its plants. True, planning in this direction has proved to be overly ambitious and has already been scaled back, but there have been appreciable costs involved nonetheless. Already GM has borrowed $125 million in 20-year promissory 2½ per cent notes with a group of insurance companies to bolster working capital, and has filed registration notice with the SEC of a new preferred stock issue of 1,000,000 shares at a price around $100. The issue is being underwritten by a syndicate organized by Morgan Stanley & Co., with exact price and dividend rate to be announced. Proceeds are expected to net about $100 million.

Finally, it is evident that if a price rise is to be instituted, it had best be done now while the "getting is good." All dealers have large backlogs of orders for new cars, guaranteeing demand for months to come. If a price increase washes out 25 per cent of these orders, the loss is not serious as long as overall demand remains solid. Far better to make the price adjustment now than at some later date when demand has softened.

The question is logical: How can a 5-8 per cent increase in price be justified now in the face of a third-quarter financial report showing a $26 million operating profit? Answer is that the profit accrued almost altogether from sales of replacement parts and other products outside the passenger car and light truck category. Sales of the latter likely showed a loss, and sound business judgment dictated against a continuation of such a condition.

Admittedly, GM competitors are placed in the comfortable position of being able to publicize no increase in prices, or perhaps of even making a token reduction in prices, if they are interested in cutting in on GM business. Fortunately or unfortunately, depending upon how you look at it, today's automobile market has not dwindled to this degree. Most producers can sell all they can build and do not yet have to cast drooling glances at their competitors' customers. The time will come —and sooner than many are figuring— when the pressure of competition will return, but that will be soon enough for talking price reductions.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Estimates by Ward's Automotive Reports

	1946	1941
January	121,861	524,037
February	83,841	509,332
March	140,777	533,878
April	248,318	489,856
May	247,620	545,321
June	216,637	646,278
July	331,000	468,897
August	359,101	164,793
September	342,727	248,751
October	409,870°	401,369
Total, 10 mos.	2,501,752	4,532,512
Estimates for week ended:		
Oct. 26	87,680	91,855
Nov. 2	95,427	92,879
Nov. 9	92,490	96,585
Nov. 16	94,000	96,990

°*Preliminary.*

Hope To Hold Line

The GM price announcement was followed by statements from other builders that no price increases would be made, conditional upon the maintenance of present costs of materials and parts. Ford's purchasing director dispatched a letter to all suppliers, reading in part: "There is plenty of justification for our raising prices at this time in order to give the company a fair and reasonable profit on its sales, but to the extent that American industry can hold the line without passing on temporary increases in costs, we believe that the free working of our competitive system soon will bring about stabilization at a reasonable level."

These were the sentiments—or perhaps prayers would be a better word—of many another manufacturer who was looking fearfully over his suppliers from the standpoint of costs.

This matter of a free economy was a new experience, like a man out of jail after five years of confinement, blinking wonderingly in the sunlight. Complete confusion was the first reaction, particularly among suppliers who had to look two ways—in the direction of the source of basic materials and at the buyers of their products.

On basic materials, steel for example, the initial outlook was encouraging. There was no talk of any across-the-board increases in price, rather there were guarded hints of some token reductions, particularly in alloy grades and in material on which numerous extras were involved. Upward adjustments were in prospect on lower-profit items, but little change seemed in prospect for the garden variety of carbon steels.

For their part, steel mills were casting

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ROOFTOP LANDING: To demonstrate the practicability of helicopters landing on the roofs of buildings to pick up or deliver mail, this coupe-type craft lands on an improvised platform on the roof of Bell Aircraft Corp.'s Niagara Falls plant, where roof is stressed for 30 pounds per sq. ft. Holding the mail pouch is M. H. Ackerman, Post Office inspector-in-charge, directing helicopter mail projects

anxious glances in the direction of the iron and steel scrap market which reacted nervously on the Monday following dissolution of price controls. Early conversation was to the effect mills were proposing an increase in all grades of steel scrap in the amount of $2.50 per ton, but retaining differentials and other price determinations developed by the OPA. A later exception was the case of open-hearth steel scrap which, it was proposed, would be increased by $5 a ton to legitimize the widespread practice of upgrading this material to the level of electric furnace scrap. This would place the price of open-hearth scrap on a parity with electric furnace, but would only bring out in the open a practice which has been going on for months.

While scrap dealers and brokers might go along with such proposals of large steel mills, they were wondering what would happen if some small mill user, desperate for material, should offer another $2 per ton over the established new market. The obvious answer is that such an offer would be met with what scrap was available, until the requirements of the high bidder were satisfied. There would be little point in larger mills boosting their ante just to meet the bid of a relatively unimportant buyer.

Shows 9-Month Operating Loss

Third-quarter financial report of Chrysler Corp. did not suggest the possibility of any price reductions, showing an operating loss of $346,137 for nine months on sales of $600,204,314. After tax carrybacks and income credit from reserves for plant rehabilitation, this was boosted to a profit of $10,292,645, or 1.72 per cent of total sales. This compared with a profit of well over $29 million in a like period of 1941 when total sales in dollars were only 10 per cent greater. Total sales in units for nine months of 1946 were 490,565.

Considering the third quarter only, sales totaled 199,947, on which operating profit of $5,376,777 was realized, or the equivalent of about $27 per vehicle. This showing was possible, however, only because of high volume of truck production on which a higher profit margin is realized, and the record high level of replacement parts production. Chrysler, like General Motors, probably incurred a loss on passenger car production.

Widespread Discontent Cited

In a rather disconsolate tone, President K. T. Keller comments in his report: "There seems to be widespread discontent on the part of workers with wages, customers with prices and investors with the prospects for the profitable operation of their properties. It is quite obvious that all are suffering to some degree from dislocations that characterize postwar periods. The composition of these dislocations giving equitable consideration to the interests of all concerned is a difficult matter at best. The solution and the time required to achieve it will be profoundly influenced by that approach to its problems which the country adopts. This is not yet clearly discernible." (This, it must be remembered, was written prior to Nov. 9).

Chrysler's net inventory as of Sept. 30 was at an all-time high of over $100 million, reflecting not only higher material costs but an unbalance brought about by the fact that some materials were available, delivered and accepted before the impossibility of procuring others made it necessary to cut schedules. Deduction from this situation is that a reduction in buying for inventory of so-called "long" items has been or will be effected.

Packard Loses on Operations

Packard's nine-month showing was darker than its large competitors. Loss on normal plant operations was $6,060,235 on sales of $64,358,312. This loss was erased by a combination of war contract terminations, tax credits, transfer of funds from wartime reserves and profits of subsidiary operations in the car and service selling field, with the result net earnings of $1,387,316 for the period were shown. Packard shipped 6728 units in October, the first month since car production was resumed that shipments approximated schedules.

European Demand Heavy

C. B. Thomas, head of the Chrysler export division, back from a third tour of Europe since V-E Day, observes demand for American goods in Europe is the largest in history, but adds that exports to England today are practically nonexistent due to monetary exchange difficulties, and a similar situation prevails in France. In his opinion, England has made the least progress in recovery, with materials and goods of all kinds scarce and workers lacking incentive to produce. By contrast, Belgium has shown marked improvement since this spring. Thomas found there an intense pride in workmanship, with labor even more efficient than before the war, especially in the steel and textile industries.

Installing New Presses

Twenty-one new stamping presses are being installed this month at the Kaiser-Frazer Willow Run plant, supplementing the six already in operation. To accommodate the large pieces of equipment, the roof of this section of the plant had to be raised 13 feet. Extensions were bolted to columns and special jacking equipment employed to raise the 280 x 60 foot section. Existing craneways also were elevated by more than 10 feet.

WEATHER
Clear with diminishing costs.

TINNERMAN NEWS EXTRA

CLEVELAND, NOVEMBER, 1946

76TH YEAR OF TINNERMAN PROGRESS

76TH YEAR OF TINNERMAN PROGRESS

BUYERS GET HOT TIP

MASS PRODUCTION OF NEW SERIES SPEED NUTS RESPONSIBLE FOR LOWEST PRICES IN HISTORY

Buyers Determine Savings by Checking Present Purchases of Threaded Nuts and Lock Washers

It is a simple matter to determine the savings made in the assembly of any product by converting to C7000 Series Speed Nuts.

Buyers are simply taking count of the number of threaded nuts and lock washers used daily on machine screws and sheet metal screws. For example, one manufacturer using 18,000 threaded nuts and lock washers per day found that the total consumption exceeded 5 million a year. The annual net saving by conversion to spring-tension Speed Nuts ran into a substantial figure. Conversion was made immediately.

In addition to saving on cost per thousand, converting to Speed Nuts also gave the advantage of time saving. Speed Nuts are applied faster, reduced weight, it lowers transportation charges and it eliminates the old problem of loosening.

Then too, in many assemblies space is limited. A Speed Nut can be applied where the space is too small to apply threaded nuts and lock washers without tedious, wasting delays.

Even if the C7000 Series Speed Nuts cost more than threaded nuts and lock washers, they would still save money. But with their lower price, the savings are still greater on every product using machine screws or sheet metal screws in any of the ten most popular sizes.

The C7000 Series Speed Nuts are accurately heat treated and are given a rust resisting finish. The live action spring steel lock washer screw with a firm grip. Loosening is fully prevented because the spring steel nut absorbs the vibration which causes loosening in conventional threaded nuts.

Billions of Speed Nuts have proved their work on hundreds of mass production products for more than a decade. The time to profit by this is now. Every day's delay is in savings otherwise effected.

NEW SPEED NUTS HAVE RUST-RESISTING FINISH

The corroding and rusting of ordinary threaded nuts presents a serious problem in connection with [illegible] and replacing [illegible] nuts must be [illegible]. Having no

Shrewd, alert, cost-conscious John Buyer, speaking today for American Industry, admitted wide affect of latest Tinnerman Announcement. He predicted that, "The new C7000 Series Speed Nuts, costing less than threaded nuts plus lock washers, will save hundreds of thousands of dollars, as well as give impetus to better and faster assembly of mass production products". From Cleveland comes word that large stocks are on hand for immediate delivery. Prices and samples of the new Speed Nuts can be had for the asking.

Speed Nuts may be used on porcelain enamel, glass or plastic assemblies *without danger of breakage*. They provide the spring tension necessary for tight assembly, yet are sufficiently resilient to prevent damage due to expansion and contraction, vibration or shock.

The *wide bearing surface* of the Speed Nut spreads the fastening load over a much greater area than does an ordinary threaded nut. Therefore, the use of separate spanner washers is unnecessary. Here again there's a saving in cost and assembly time.

Speed Nuts are *self-locking*, for their unique spring action provides a positive lock that prevents vibration loosening. Thus the use of separate lock washers is completely eliminated. You save the cost of the washers and the time necessary to handle and install

SPEED NUTS ELIMINATE LOCK WASHERS

With the use of C7000 Speed Nuts, the lock washer is necessary and obsolete. The purpose of the lock washer is to supply a spring-tension between the threaded nut and the work. With the spring-tension incorporated in the Speed Nut, only one part is necessary instead of two. Only one part to purchase, one part to handle. In addition to this, the Speed Nut affords a spring-tension that can be secured with a lock washer. And Speed Nuts never have to be chiseled or sawed off to install a new nut for replacement.

There's no expensive delay in the assembly line because of product damage, when Speed Nuts are used. For Speed Nut spring tension resiliency prevents tightened parts to such a degree that porcelain enamel, glass or plastic might crack or chip.

Speed Nuts are also insurance against damage in transit. Your products are subject to severe vibration and shock while being packed, handled and shipped. Speed Nuts provide a resiliency that cushions and protects porcelain enamel and glass assemblies against damage.

Eliminating a lock washer not only cuts the number of parts in half but it also cuts the work in half. The Speed Nut also has a wider bearing surface. That feature also prevents distortion of the panel or part to which the nut holds.

When you cut down the amount of buying you reduce stocking problems and handling problems. You save on transportation charges and you have a nut that does a more satisfactory holding job.

Many [illegible] themselves in [illegible] tion, eliminating expensive welding, riveting or clinching operations, as well as the costly equipment and space required for such operations. Moreover, installing these Speed Nuts *does not require skilled labor.*

Since Speed Nut prongs can be incorporated in most any shape or form, hundreds of Speed Nuts have been designed to combine several parts into one. Thus, a single Speed Nut often replaces two, three or more parts and does the same job easier and faster.

The Speed Nut principle of fastening lends itself to a flexibility of design possessed by no other fastener. Speed Nuts can be made to meet the requirements of specific applications, to simplify and improve product design, and do a better and faster assembly job.

[illegible] replacement washers, as [illegible] hundreds of special fasteners to meet the requirements of out-of-the-ordinary applications.

In addition, our Engineering Department is at your service at all times to help solve your fastening problems, and would welcome the opportunity to analyze your fastening requirements.

A changeover to the "Fastest Thing in Fastenings" will very definitely improve your product, speed up production and reduce your total net assembly costs.

Speed Nuts provide a *double* lock on bolt or screw to prevent vibration loosening . . . a thread lock and a spring lock. Their *live* spring action *absorbs* vibration, instead of merely resisting it, insuring a tight attachment for the life of the product.

[illegible] are attached [illegible] Nuts always retain their *spring tension locking power.* And Speed Nuts never have to be chiseled or sawed off, requiring a new nut for replacement.

There's no expensive delay on the assembly line because of product damage, when Speed Nuts are used. For Speed Nut spring tension resiliency prevents tightening parts to such a degree that porcelain enamel, glass or plastic might crack or chip.

Speed Nuts are also insurance against damage in transit. Your products are subject to severe vibration and shock while being packed, handled and shipped. Speed Nuts provide a resiliency that cushions and protects porcelain enamel and glass assemblies against damage.

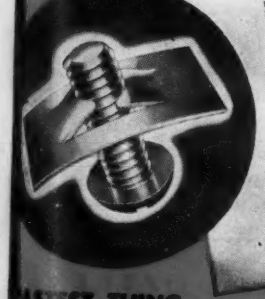
[illegible] size retaining [illegible] sary "float" to compensate for misalignment of clearance holes.

When ordinary threaded nuts are permanently attached to parts for blind assembly, and the parts painted, the threads become clogged with paint. This makes it necessary to delay final assembly until the threads can be retapped. Having no threads, Speed Nuts *do not clog.*

The corroding and rusting of ordinary threaded nuts presents a serious problem in connection with servicing and replacing parts, because the nuts must be chiseled or sawed off. Having no threads, Speed Nuts *will not "freeze"* to bolts or screws, and are easily removed.

Greater Strength is Result of 20 Years of Engineering Experience

Back of the C7000 Series is all the experience of the Tinnerman factories and their extensive engineering development department. For more than 20 years the Tinnerman organization has devoted itself to studying and solving assembly problems. No other organization has a comparable record of engineering development in this field.



Speed Nuts

PATENTED

*Trade Mark Reg. U. S. Pat. Off.

TINNERMAN PRODUCTS, INC. • 2039 FULTON ROAD • CLEVELAND 13, OHIO

Greater Use of Oil, Gas Field Equipment Seen

Dresser head forecasts increasing use of raw materials to make fuels. New equipment market seen large

SUBSTANTIAL expansion in the fields of oil and gas equipment was forecast by H. N. Mallon, president, Dresser Industries Inc., Cleveland, at a recent meeting of sales representatives and technical experts of member companies operating in these fields. The meeting was held at the Edgewater Beach Hotel, Chicago.

Increasing use of the raw materials from which petroleum products are made was cited by Mr. Mallon as indicating the trend in the future. "Natural gas can now be used as easily and economically as crude oil as the raw material for the refineries," Mr. Mallon stated. "Hydrocol plants like the one under construction at Brownsville, Tex., will be erected elsewhere to produce high-octane gasoline directly from natural gas. This same conversion technique will be adapted later to produce gasoline from coal," Mr. Mallon continued.

"New processes require variations in machinery design, sometimes new types of equipment altogether," he declared. "Advance knowledge of these developments combined with engineering ingenuity can and will produce a large volume of business for those companies alert and capable enough to take advantage of the trends.

"Meantime active drilling for oil and gas and further conservation measures to prevent waste of these valuable fuels give assurance of a healthy market for standard oil field products," Mr. Mallon said. "Add to this domestic market a foreign demand for oil equipment of all kinds in unprecedented quantities and the outlook for at least another twelve months is very favorable," he stated.

Atomic Laboratory To Be Built at Schenectady

Plans for the establishment of a $20 million nuclear research laboratory near Schenectady, N. Y., for the study of power generation from atomic energy has been announced by the War Department. General Electric Co. will operate the nuclear power research center and is serving as the prime contractor.

This will be the fourth network of laboratories established by the Manhattan Project to further nuclear research. Dr. C. G. Suits, vice president and director of research, General Electric Co., will have general supervision of the Knolls Atomic Power Laboratory at Schenectady. Responsibility for the atomic power pile project, which is the principal activity of the new laboratory, has been assigned to Dr. Kenneth H. Kingdon, senior physicist at General Electric. Scientists specializing in chemistry, chemical engineering, metallurgy, electrical and mechanical engineering will compose a considerable proportion of the group working on the program.

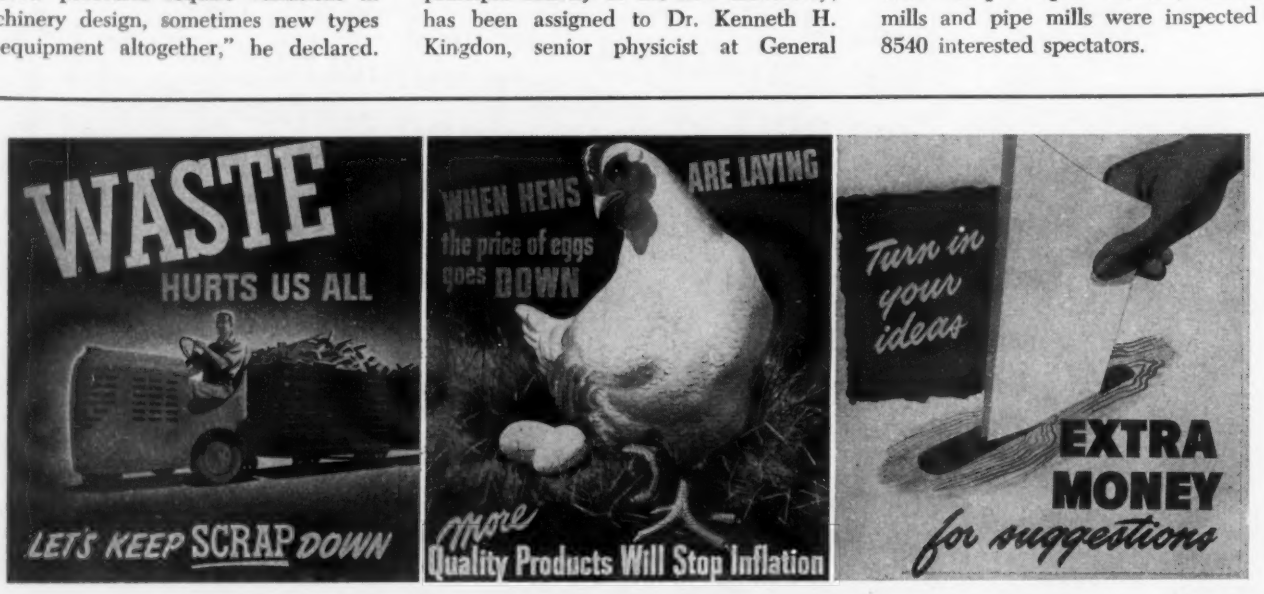
First Anniversary Party To Be Held at Willow Run

Kaiser-Frazer Corp. and Graham-Paige Motors Corp. are currently celebrating the first anniversary of their occupancy of Willow Run, the huge former bomber plant near Detroit. Producing Kaiser and Frazer automobiles and the Frazer line of farm equipment, the companies now employ more than 6000 people at the plant.

In celebration of the year in Willow Run, the companies are holding a first anniversary dinner and plant tour on Nov. 20.

Open House in Youngstown Attracts More Than 30,000

More than 30,000 residents of the Youngstown area visited plants of three of Youngstown's largest steel mills recently and hailed the open house as a huge success. Carnegie-Illinois Steel Corp.'s tours through its Ohio works, McDonald and Upper Union mills attracted approximately 11,500 visitors; Youngstown Sheet & Tube Co. had an estimated 13,000 people visit its Campbell and Brier Hill plants, and Republic Steel Corp.'s open hearths, blooming mills and pipe mills were inspected by 8540 interested spectators.



NEW PLANT POSTERS: Use of plant posters is widespread throughout all industry, and during the war their copy theme was largely patriotic in tone. The change in postwar poster appeals is illustrated by the accompanying samples of a new General Motors Corp. series for posting on plant bulletin boards at weekly intervals throughout the next quarter year.

Three general ideas are emphasized. One deals with productivity and covers such subjects as care of tools, good housekeeping, pride in workmanship, reduction in scrap and use of improved production methods. A second emphasizes employee benefits in GM plants, such as training, suggestion plans, group life insurance, health, safety and pleasant working conditions. The third concentrates on the basic philosophy that everybody profits when business prospers

BRIEFS . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Gayton Co., Youngstown, newly formed, has developed a device to lessen heat losses in the open-hearth production of steel. The idea is being tested by a local steel company.

—o—

Don W. Miller Co., Cleveland, has opened a plant at 4758 Warner Rd., that city, for the exclusive purpose of cutting to size steel bars, rods and tubing and nonferrous metals.

—o—

Speco Inc., Cleveland, manufacturer of automotive, household and industrial chemicals, has opened a new export sales office at 15017 Detroit Ave., that city.

—o—

Gerotor May Corp., Baltimore, has appointed Battersby, Hendee & Prentzel, Philadelphia, as representatives for air and hydraulic valves, cylinders and hydraulic pumps in the Philadelphia territory.

—o—

Eastern Engineering Co., New Haven, Conn., has been consolidated with Automatic Signal Corp., East Norwalk, Conn., and has formed Eastern Industries Inc. with headquarters at New Haven.

—o—

Formica Insulation Co., Cincinnati, is installing additional press equipment for fabrication of laminated decorative material which will expand its production to the highest level in its history. Three new presses are expected to be ready for production by 1947, and five additional presses for fabrication of laminated rods are also nearing completion.

—o—

General Electric Co., Schenectady, N. Y., has received a $1 million contract from the Army Air Forces to provide special electrical equipment for the first two production models of the Northrop Flying Wing B-35 bomber. The equipment will consist of a new alternating current electrical system and the GE gunnery control, including armament and sighting systems.

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Luscombe Airplane Corp., Dallas, Tex., under its employees' profit sharing plan, has announced that the employees' proportion of the profits for the quarter ended Sept. 30 was $98,594, an amount nearly three times as large as their share in the previous quarter.

—o—

Tool-Die Engineering Co., Cleveland, until now an engineering firm, is entering the manufacturing field and will produce zinc and aluminum castings and permanent molds. The company is rebuilding a former City Ice & Fuel Co. plant in Cleveland and will install new self-contained hydraulic die-casting machinery.

—o—

Carboloy Co. Inc., Detroit, has appointed Wm. H. Taylor & Co. Inc., Allentown, Pa., as distributor for carbide tipped cutting tools in the Allentown, Bethlehem and Easton, Pa., area.

—o—

Tennessee Copper Co., Copper Hill, Tenn., has leased a portion of the Alabama Ordnance Works at Childersburg, Ala. The facility will be used to manufacture acid phosphate fertilizer.

—o—

Service Caster & Truck Corp., Albion, Mich., is expanding its display rooms at 134-138 Washington St., New York, to exhibit its entire line of materials handling equipment during the national power show, Dec. 2-7.

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Stanley Tools Division, Stanley Works, New Britain, Conn., has prepared a series of 36 safety charts, each humorously illustrated and complete with a safety message.

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Arthur D. Little Inc., Cambridge, Mass., recently celebrated its sixtieth anniversary as a consulting industrial research laboratory.

—o—

Geometric Tool Co., New Haven, Conn., has appointed Minneapolis Iron Store, Minneapolis, and Warner Hardware Co., that city, as distributors for its line of standard threading tools and chasers.

—o—

Bede Products Inc., Cleveland, successor to the former Bede Products Co., has plans to build a new plant when building conditions improve. The plant is currently expanding its present facilities for industrial finishing specialties.

—o—

Monsanto Chemical Co., St. Louis, has placed a 25-year debenture issue to provide $30 million for the company's expansion program with a group of five insurance companies. The money will be used in part to finance the $10 million purchase from War Assets Administration of a styrene plant at Texas City, Tex.

—o—

B. F. Goodrich Chemical Co., Cleveland, is closing its Bells Lane synthetic rubber plant in Louisville and will switch to production of Geon plastic in the vacated facilities.

—o—

Jas. P. Marsh Corp., Chicago, has plans for a factory and office building in Skokie, Ill., containing approximately 100,000 square feet. The plant will be used for manufacture of industrial instrument and heating specialties.

—o—

Collman Mfg. Co., Erie, Pa., has begun production of an electric shaver, the Collman 58, which will be introduced before Christmas.

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Abdite Gauge Co., Dearborn, Mich., has been organized as a corporation and has enlarged its buildings and added new equipment.

—o—

General Fireproofing Co., Youngstown, has sold its Paper Products Division to Smead Mfg. Co. Inc., Hastings, Minn. The vacated factory space will be used for increased production of metal office furniture.

—o—

Board of Commerce, Bradford, Pa., and 300 independent oil producers will celebrate the seventy-fifth anniversary of the opening of the Bradford oil field Nov. 18-20.

—o—

American Brake Shoe Co., New York, is doubling the capacity of its National Bearing Division, Meadville, Pa., by erecting a new $1 million plant. Completion of the facility is expected next September.

—o—

Central Pattern & Foundry Co., Chicago, will change its name to Central Aluminum Casting Corp. on Jan. 1. The company is understood to be considering construction of an aluminum casting plant near Mexico City, Mexico.

—o—

Southern States Iron Roofing Co., Savannah, Ga., recently held a preview at Birmingham of its new Everwear all-aluminum prefabricated home, which features aluminum walls and roof and other interior and exterior metal parts. Production of the home will begin on Dec. 1 with deliveries expected to start in late December or early January.

—o—

Pullman-Standard Car Mfg. Co., Chicago, has delivered a new streamlined passenger train to Chicago & Eastern Illinois Railroad. The train, called the "Whippoorwill," has begun daily service between Chicago and Evansville, Ind.

—o—

American Steel & Wire Co., Cleveland, has moved its Cleveland district sales office to Room 1001, Union Commerce Bldg., Cleveland 14.

CPA Promises More Steel for West

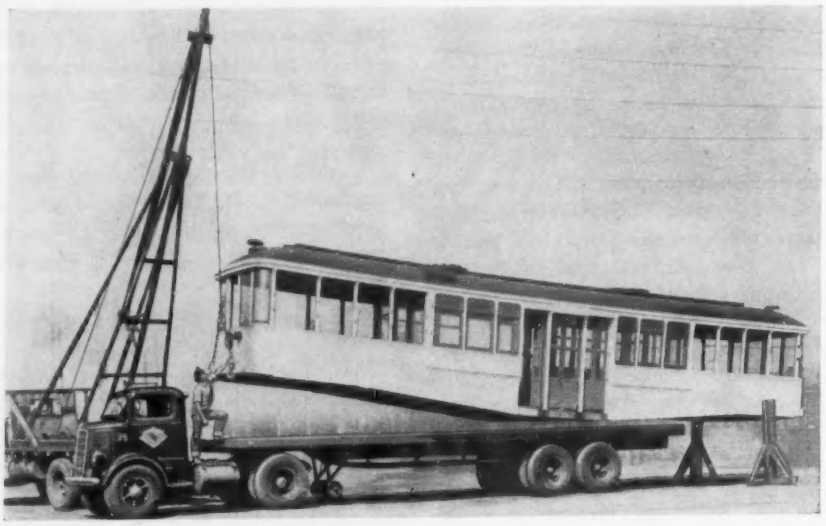
Larger supply of sheets will be made available to Pacific area fabricators. Scrap shortage threatens to curtail area's ingot production

SAN FRANCISCO

LARGER steel shipments to the West Coast, to alleviate the serious shortage now facing this area's fabricating plants and construction industries, have been promised by John D. Small, head of the Civilian Production Administration.

Rep. Franck R. Havenner has been advised by Mr. Small that steps have been taken to increase the supply of steel sheets available for the West Coast. Mr. Small warned, however, that because there continues to be a nation-wide shortage of steel the West cannot expect to get sufficient steel to meet all demands.

Mr. Small's communication to Mr. Havenner followed an active campaign by chambers of commerce, industrial leaders, and local government officials and congressional representatives for action to relieve the plight facing a large number of West Coast firms. Several fabricators have already been forced to close their doors or reduce operations drastically, and nearly all have been affected by the steel scarcity. It is probable that others will be forced to suspend before the increased shipments begin to be felt.



LAST SHUTTLE: When many Los Angeles street cars reach the end of the line and are retired from service, they start life all over again. They are sold to contractors for conversion into dwellings. Here a retired unit is loaded on a 35-foot Fruehauf trailer ready to be moved to a homesite

Action Taken To Ease Shortage

Mr. Small, in reporting to Mr. Havenner, said the following steps had been taken:

1. Price differentials on freight shipments to the West Coast have been eliminated. Under the former regulations, the increased shipping cost to the producer caused him to turn to nearby outlets for his products, as, in effect, the freight charges amounted to a price cut on those products when shipped to the West Coast.

2. Civilian Production Administration has obtained from eastern steel producers assurances that shipments to West Coast warehouses will be maintained and not sacrificed to the requirements of customers who buy directly from the producers.

3. A monthly survey on steel distribution through warehouses has been started by the CPA, and arrangements are being made to obtain reports on West Coast shipments from the principal steel producers.

Meantime, steel production at West Coast mills is being threatened increasingly by the scrap shortage. If it becomes worse, any possible benefits from greater eastern shipments will be nullified.

Pointing up the prospects for a serious famine from that source, William A. Ross, president of Columbia Steel Co., calls the current crisis facing California mills the "gravest in the experience of the industry."

"California's steel industry depends largely on an ample supply of scrap as a basic raw material," Mr. Ross said. "In order to meet the tremendous demand for steel products produced right here in our state and to keep our steel mills and foundries operating at or near capacity, it requires approximately 1,380,000 tons of purchased scrap annually, or about 115,000 tons a month. It is estimated present receipts of scrap at steel mills and foundries in the state now are, on the average, only 60 per cent of current consumption."

Mr. Ross estimated that scrap inventory of leading consumers is sufficient to last only a few days at present, the lowest in many years.

"Unfortunately, this grave situation has been aggravated by the necessity of shutting down one of our Utah blast furnaces for a long overdue relining," Mr. Ross continued. "This furnace has been an important source of pig iron for the entire western iron and steel industry, and loss of its production will cause the current scrap crisis to become more acute."

Mr. Ross said the situation possibly might be relieved if the current shipbreaking program is speeded up. Under this program obsolete vessels of the Navy and merchant marine are being turned over to salvage operators to be broken into scrap. Such a program is under consideration at the Port of Stockton and other San Francisco bay area shipyards, Mr. Ross said. "If the ship scrap is made available immediately in large amounts, the chaotic conditions, which face the steel and allied industries of California, will be alleviated," he said.

A third threat to western steel supplies which is potential rather than actual is the prospect of a coal strike. Should a strike eventuate, operations at the West's biggest mill, the Geneva Steel Co. plant in Utah, would soon halt.

Employment Nears Wartime Peak

Providing, however, that the strike is not called, Geneva probably will be employing 4000 workers by the end of this year, only 200 less than at the mill's employment peak in wartime.

The structural mill at Geneva will be started some time this month, no definite date having been set as yet. Scheduled to be in operation by the end of the year are six open-hearth furnaces, all three blast furnaces and all four batteries of coke ovens. The only thing which now will disrupt that schedule is a coal strike, the company says.

At present Geneva is operating two blast furnaces, two batteries of coke ovens, three open hearths and rolling one shift on

the slab and bloom mill and two shifts on the plate mill. The plant now is employing about 3000 workers.

Krug Urges New Power Developments in West

LOS ANGELES

Severe shortage in electric power will materialize in southern California and the Southwest generally unless action is taken at once for additional development of the Colorado river and other power sources, Interior Secretary Julius A. Krug predicted during his visit here.

The Davis Dam construction below Boulder Dam, he said, is progressing rapidly, but the additional power derived from that source will be insufficient for the needs of the region if growth continues at the present rate. As to the latter, he said:

"When I was here just before the end of the war, people were worrying that, with peace, your industrial empire would evaporate. But it is here—and growing. It can't help but bring many, many people into this area."

Mr. Krug said the federal government has finished its survey of the Colorado river and that it only remains for the various states to decide how much each will get in acre-feet. The river system itself affords unlimited power potentials.

New $4 Million Power Generating Plant Authorized

LOS ANGELES

The Los Angeles Department of Water & Power last week was authorized by the CPA to build a $4 million electric generating plant at Wilmington with the announced aim of "breaking the threatening electric power shortage in the area."

A second authorization was for a $2,530,000 factory to make sanitary ware, to be erected at Torrance, near Los Angeles, by the American Radiator & Standard Sanitary Corp. of Pittsburgh. Production at this plant will be at the rate of 10,500 units a week. The structure as planned will be 392 x 1320 ft. Of the total cost, $780,000 will be in processing equipment.

The city's new steam turbine power plant, to be begun next Jan. 1, consists of buildings to house three 75,000 kw turbogenerating units, associated boilers and auxiliaries and includes service buildings, a warehouse, a chlorine and water treatment building, a gas meter house and several miscellaneous auxiliary structures.

According to Louis M. Dreves, southern California chief of the CPA, "The steam plant is most essential to insure the continued industrial development of the Los Angeles area which, since the war, has mounted at a rate not wholly foreseen even a year ago."

Coulee Dam Produced 20 Billion KWH in 5 Years

SEATTLE

Coulee Dam in the first five years of its operation has produced 20 billion kilowatt-hours. Five years ago the first of the 108,000 kw generators was installed and during the war five similar units were added. Two 75,000-kw units, originally intended for use at Shasta Dam, also have been installed at Coulee, but will be transferred to Shasta. Three 108,000-kw units also will be built for Shasta.

Ocean Shipping Rates from East to West Coast Raised

Advances in vessel transportation charges have been authorized, effective Nov. 6, up to 7c per 100 pounds for steel products on shipments from Atlantic ports to West Coast. Similar advances became effective on Nov. 7 for shipments from Gulf ports.

On the following steel products the vessel transportation charges have been raised from 55.50 cents basic rate per 100 pounds to 62.50 cents; not including the transportation tax of 3 per cent in both instances as well as loading and switching charges: Sheets, 16 gage and heavier not bent; plates; piling; bars; strip; angles; beams; channels; and columns. Basic freight rate for pipe, not over 12-in. inside diameter and 42 feet in length, was increased from 58.50 cents to 62.50 cents Nov. 6, and a further increase to 65.50 cents is proposed within 30 to 60 days. No change in vessel freight rates for plain wire became effective Nov. 6, but rates are expected to be increased up to 65.50 cents later; nails and some specialty wire items were boosted from 56 cents to 60 cents on Nov. 6 and will advance to 63 cents within two months.

Proposed reduction of freight rates from Pittsburgh, Youngstown and Cleveland steel centers to East Coast thence to Pacific ports has been agreed to in principle by the railroads but final decision on the matter is held up pending ICC's decision on carriers' general freight rate increase request of 25 per cent.

It is pointed out that if the present upward trend in intercoastal vessel transportation charges continues it soon will be as cheap to ship steel to West Coast all rail from Chicago.

Western Railroads Ordered To Stop Free Switching

Interstate Commerce Commission recently ordered designated railroads to terminate free switching and other services performed beyond the assembly yard in hauling metals and ores for various western companies. The roads were ordered to institute scheduled charges at not less than the cost of these services.

Railroads affected include those serving the American Smelting & Refining Co. plants at Garfield and Murray, Utah, and Leadville, Colo., and roads serving the United States Smelting, Refining & Mining Co. plant at Midvale, Utah.

Power and Duties of Stockholders Stressed by General Mills Chairman at Regional Meeting

LOS ANGELES

POWER of stockholders to work for the good or ill of any company whose ownership they share was emphasized by James F. Bell, chairman, General Mills Inc., at a meeting of southern California stockholders of his company.

Mr. Bell said: "You are not just names on a list. You are all sorts and kinds of Americans. You are an integral part of an enterprise engaged in the manufacture of goods and services. You have a duty to see that the business is conducted in the public interest. You have a responsibility likewise to the workers, whose jobs you have created and whose tools you have furnished."

Mr. Bell said he regarded the chairman of a board as the link between owners and management. He attends all meetings in person. The affairs of the company are discussed in detail with owners, whether stock owned is one share or 1000.

He outlined how General Mills Inc. has created and developed various complex processing and packaging machines in precision machine shops. He told of a typical promotion around the Tru-Heat electric iron, with the public service department of the company pushing the item through publication of a "Betty Crocker Ironing Primer." A new and originally designed coffeemaker will be introduced next year, he disclosed.

Similar stockholders meetings are scheduled this month in Detroit, Buffalo, New York, Chicago and other cities.

Men of Industry

J. T. MYERS

WARD DOUGHERTY

GILBERT SOLER

J. T. Myers has been elected vice president in charge of sales and production, Davey Compressor Co., Kent, O. For the last year, Mr. Myers, who served in the Navy during the war, was assistant general manager of the company. He has been a member of the Davey organization for 5 years.

—o—

Ross W. Swogger has been appointed export manager, Speco Inc., Cleveland. His first project will be a world-wide sales campaign on a new paint for the company. Mr. Swogger was export manager, Oster Mfg. Co., Cleveland, and had been with that firm for over 20 years.

—o—

Colgate W. Darden Jr., chancellor, College of William & Mary, Williamsburg, Va., has been elected a director of United States Rubber Co., New York. He succeeds Lammot du P. Copeland, of Wilmington, Del., who had been a director of the company since 1940.

—o—

Philadelphia chapter, Institute of Scrap Iron & Steel has elected the following officers: President, **John T. Hunt,** M. J. Hunt's Sons, Philadelphia; vice president, **Harry Stave,** Stave Bros., Philadelphia; treasurer, **Dominic J. Giordano,** Giordano Iron & Metal Co., Camden, N. J.; and continuing as secretary, **Marcus J. Margulies,** A. M. Wood & Co. Inc., Philadelphia.

—o—

Dr. James H. Greene, executive vice president of the Chamber of Commerce, has been appointed Pittsburgh community chairman, Committee for Economic Development.

—o—

Frederick S. Blackall Jr., president and treasurer, Taft-Pierce Mfg. Co., Woonsocket, R. I., has gone to England on a technical mission having to do with unification of Anglo-American screw thread standards. He will return to the United States about Dec. 1.

—o—

Ward Dougherty, export manager, Machine Division, Osborn Mfg. Co., Cleveland, has departed for Mexico for a 1 month survey of the foundry molding machine industry in that country. Mr. Dougherty plans to visit Mexico City, Saltillo, Monterey, Puebla, and other important Mexican industrial centers.

—o—

William O. Hess, a project engineer in the engineering department, Formica Insulation Co., Cincinnati, has gone to England to give counsel to engineers and management of DeLaRue Insulation Ltd., British licensees for production and marketing of Formica decorative material.

—o—

Robert M. Hayes has been elected secretary, Oliver Iron & Steel Corp., Pittsburgh. Mr. Hayes has been with the firm since 1944, as treasurer. Prior to joining Oliver, he was assistant treasurer of United States Steel Corp. of Delaware. **W. F. Roll,** who has been assistant treasurer of the Oliver organization, will serve in addition, as secretary. Mr. Roll has been with the company for over 44 years.

—o—

Herbert R. White, recently released from the Army, has been appointed general manager Eclipse Counterbore Co., Detroit. A former executive of General Motors Corp., Detroit, Mr. White resigned from that organization in 1937 to join Motor Products Corp., Detroit.

—o—

Arthur S. Klopf has been appointed works manager, Western Foundry Co., Chicago. He will have charge of the firm's Chicago, Holland, Mich., and Morris, Ill., plants. Mr. Klopf, formerly senior engineer with Lester B. Knight & Associates Inc., Chicago, began his industrial career with Worthington Pump & Machinery Corp., East Harrison, N. J., later being associated with Allis-Chalmers Mfg. Co., Milwaukee, Marquette University, Ross-Meehan Foundries, Chattanooga, Tenn., Kearney-Trecker Products Corp., Milwaukee, and Hansell-Elcock Co., Chicago.

—o—

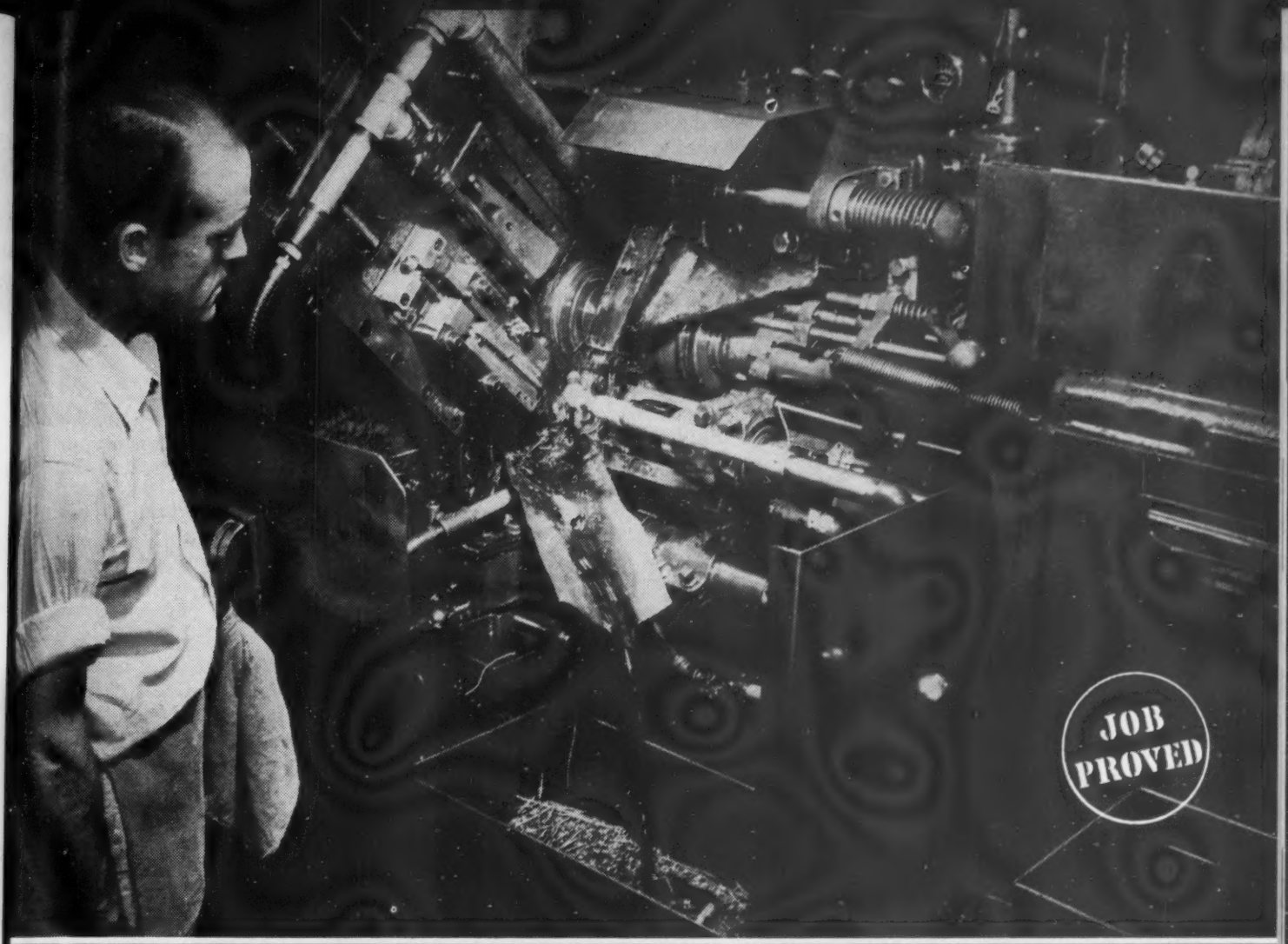
Gilbert Soler has been appointed general superintendent, Atlas Steels Ltd., Welland, Ont. Mr. Soler had been assistant general superintendent, Steel Division, Timken Roller Bearing Co., Canton, O. He joined Timken in 1931. Prior to that, he was a research engineer, Republic Steel Corp., Cleveland. **A. C. Texter** has been appointed assistant general superintendent for Atlas Steels Ltd. Mr. Texter had been melting superintendent for the firm since 1931. Before joining Atlas, he was assistant melting superintendent, Park Works, Pittsburgh, Crucible Steel Co. of America.

—o—

Charles Wykoff Boll Jr. has joined the staff of the New York office, Udylite Corp., Detroit. He will operate in Virginia, Maryland, Delaware and part of Pennsylvania. Mr. Boll served in the Marine Corps during the war. Prior to entering the service, he was a chemist with Harrisburg Steel Corp., Harrisburg, Pa.

—o—

W. M. Smith has been appointed general sales manager, and **A. E. Stubbs,** foreign sales manager, Bryant Chucking Grinder Co., Springfield, Vt. **L. C. Gilchrist** has been placed in charge of the company's new Detroit office. **Thomas**



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Type of Machine: New Britain Gridley automatic screw machine, 2" capacity, No. 61, six spindles.

Metal: S.A.E. 4140 bar stock.
Operation: Forming, drilling, tapping, and threading.
Speed: 85 SFPM

SUNICUT is a free-flowing, transparent, correctly balanced sulphur, lard, and mineral oil combination. It has been "Job-Proved" in hundreds of shops. For additional proof of what Sunicut can do for you, test it in your own shop under your own operating conditions!

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SUN
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INDUSTRIAL PRODUCTS

Detherow and **Walter Augustenovich** will direct the firm's new Chicago office, and **Robert F. Manley** will be in charge of the new office in Cleveland.

—o—

T. S. See has been appointed first vice president and general manager, La Salle Steel Co., Chicago. **A. Frank Golick** has been appointed vice president in charge of sales for the firm. Both men have been with the company for a number of years.

—o—

Philip X. Mavin has been appointed to the new post of field engineer for the New York district, Goodyear Tire & Rubber Co., Akron. He will have headquarters in New York. Mr. Mavin has been with the Goodyear organization since 1943, having started in Akron as an engineer for Goodyear Aircraft Corp.

—o—

W. Herbert Everitt has been appointed sales representative for Hydropress Inc., New York. His office is in Seattle, and his territory includes Washington, Oregon and British Columbia.

—o—

Homer N. Woods, Buffalo attorney and executive, has been elected a director of Barcalo Mfg. Co., Buffalo.

—o—

Martin Kellner has been appointed sales and advertising manager, Brown-Brockmeyer Co., Dayton, O. He had been sales promotion manager for the company. Prior to assuming his duties at the home office, Mr. Kellner acted as district representative in the Michigan territory.

—o—

John H. Hurley, sales executive, Johnson Wax Co., Racine, Wis., has resigned to return to the East and open his own manufacturers' selling agency in New York. Prior to his Johnson Wax sales and promotional responsibilities, which currently included the management of the Export Division, Mr. Hurley was a field sales executive with Sylvania Electric Products Inc., New York, in the New York and Chicago markets.

—o—

Edgar E. Brosius Co. Inc., Pittsburgh, has announced the following appointments: **Edgar E. Brosius,** chairman of the board; **Leonard W. Bughman,** president; **J. E. Sullivan,** vice president; **James H. Davis,** secretary and treasurer.

—o—

W. B. Worden has been appointed central sales manager, R. G. LeTourneau Inc., Peoria, Ill. He will have headquarters in Peoria, and will supervise activities of company district representatives in approximately 20 midwestern states between the Canadian and Mexican borders. Mr. Worden succeeds **M. E. Miller,** who resigned to become sales manager for Rozier-Ryan Co., LeTourneau distributor in St. Louis. Mr. Worden had been district sales and service representative for LeTourneau in southern California and Arizona for the last 4 years. **O. A. Williams** has been named manager of the firm's eastern sales office, which has been moved to Washington. Mr. Williams was appointed a district sales representative in 1944. **Henry Cain,** recently released from the Army, has been appointed assistant to the eastern sales manager for the Le Tourneau company. **Harold F. Stenstrom** has been named district sales representative for the company, with headquarters in Memphis, Tenn. He will serve LeTourneau distributors in Missouri, Tennessee, Arkansas, Louisiana and Mississippi.

—o—

Ira J. Bready has been appointed district manager, Cincinnati territory, Liquid Conditioning Corp., New York. **B. F. Soffe** has been appointed district manager for the company in the lower Michigan territory, with headquarters in Detroit. **H. H. Morrison** has been appointed district manager in the central and lower South for the firm, with headquarters in Chattanooga.

—o—

Roland B. Fischer has joined the staff of Battelle Memorial Institute, Columbus, O., where he will be engaged in research in physical metallurgy. He was in El Paso, Tex., with American Smelting & Refining Co., New York. Mr. Fischer served in the Army during the war.

—o—

James R. Garvey has been appointed to the development engineering staff, Bituminous Coal Research Inc., Pittsburgh. He will expedite production and home testing of the firm's smokeless stoves. He had been with Pennsylvania-Central Airlines Corp., Washington. During the war, Mr. Garvey served in the Army.

—o—

Robert W. Smith, employee on the staff of **George W. Rooney,** vice president-comptroller, United States Steel Corp. of Delaware, has retired. He served over 47 years with United States Steel subsidiaries. In 1936, he became assistant comptroller of United States Steel Corp. of New Jersey, and later was made audit supervisor of that firm. He came to the Delaware firm as a member of the staff of the vice president-comptroller in 1942.

—o—

Homer A. Goddard, lubrication engineer, has been appointed assistant division manager in charge of industrial lubricating sales, Pittsburgh Division, Gulf Oil Corp., succeeding **S. A. Newman** who has been appointed chief turbine lubrication engineer in the firm's general office in Pittsburgh. The Pittsburgh Division of the company embraces western Pennsylvania and West Virginia. Mr. Goddard, who joined Gulf in 1932, had been serving as superintendent of industrial lubricating sales for this territory.

—o—

Herman V. Gaertner, assistant treasurer, B. F. Goodrich Co., Akron, has been elected controller of the company, following the retirement of **T. B. Tomkinson,** effective Dec. 31. Mr. Gaertner, who joined the firm in 1916 as a clerk in the Accounting Division, was appointed assistant controller in 1929 and assistant treasurer in 1943.

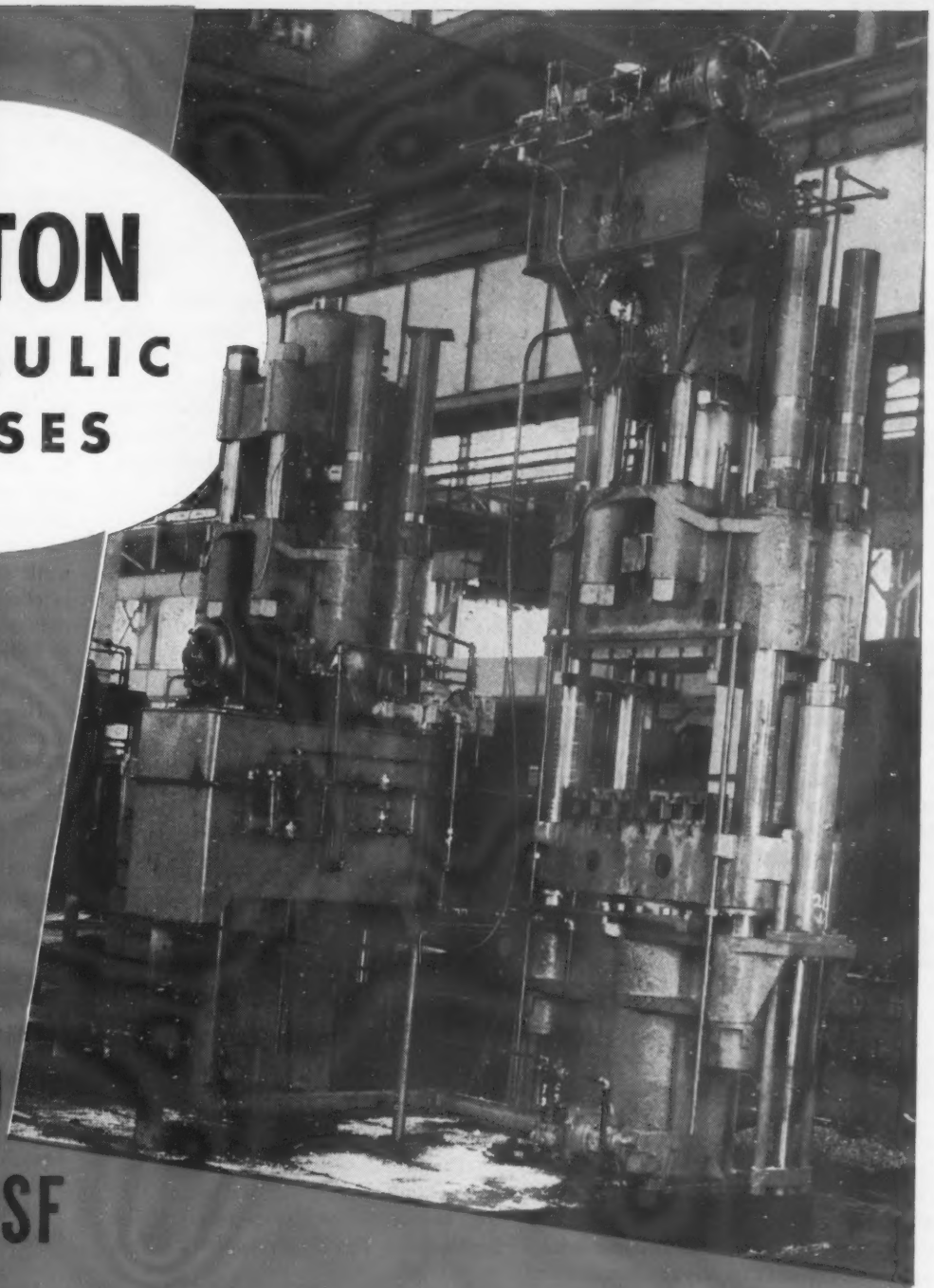
—o—

Louis Sirk, Trojan Scrap Iron Corp., Troy, N. Y., has been elected president of the Capitol District chapter, Institute of Scrap Iron & Steel. **Philip Sher,** Hudson Scrap Iron & Metal Co., Albany, N. Y., has been elected vice president of the chapter, and **Charles Buff,** Buff & Buff, Schenectady, has been elected

MARTIN KELLNER

W. B. WORDEN

500 TON HYDRAULIC PRESSES



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Not the sort of work you ordinarily find a steel foundry doing? Well, we're not press manufacturers, true—but we're also far from being an ordinary steel foundry. PSF is not only equipped to produce steel castings from a few pounds to a hundred tons, but to turn out completely finished and assembled units on contract—either sub-assemblies or entire machines—*built 100% to your specifications.* • For just the castings or the complete job, call on PSF.

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Glassport, Pa.

Plants:

Glassport, Pa. and McKeesport, Pa.

Sales Offices:

New York — Chicago

Philadelphia — Washington

48 YEARS OF STEEL CASTING KNOWLEDGE

treasurer. **Benjamin Apple,** Symansky Bros., Watervliet, has been re-elected for his sixth term as secretary, and **Joseph Klein,** Joseph Klein Co., Albany, is chairman of the executive committee.

—o—

O. J. Malina has been named sales manager, Heating & Ventilating Division, D. J. Murray Mfg. Co., Wausau, Wis. His headquarters are in Chicago. Mr. Malina was located in Chicago as mid-west representative of the company, prior to his new appointment.

—o—

Willie Thomsen has been appointed assistant purchasing agent, Dumore Co., Racine, Wis. For the last 5 years, he was assistant production manager of the company.

—o—

Gottfrid Olson has been granted a leave of absence from National Founders Association, Chicago, to make a tour of Europe to determine industry and foundry conditions. **David G. Anderson** succeeds Mr. Olson as foundry engineer for the association.

—o—

Stanley A. Sanford has been appointed supervisor of raw materials, American Steel & Wire Co., Cleveland, subsidiary of United States Steel Corp. He joined American Steel & Wire Co. in November, 1943, as metallurgist and research chemist, and 6 months ago was named assistant supervisor of raw materials.

—o—

Frank L. Magee, general production manager, Aluminum Co. of America, Pittsburgh, has been made a vice president of the company. He will continue his present duties, reporting to **I. W. Wilson,** vice president in charge of production. Mr. Magee joined the company in 1917 as a sales apprentice. In 1937, he left the district managership of the Atlanta sales office to become manager of sheet sales for the company, with headquarters in Pittsburgh. In 1943, Mr. Magee became general production manager and assistant to Mr. Wilson.

—o—

J. Glenn Harrison has been appointed manager, Steel Production Division, West Virginia Steel & Mfg. Co., Huntington, W. Va. For 18 months before joining the firm, Mr. Harrison was price analyst, steel mill products section, metals price branch, Office of Price Administration, Washington. Prior to that, he was assistant manager, War Relations Division, Wheeling Steel Corp., Wheeling, W. Va.

—o—

L. E. Batten has been appointed director of purchases, Nichols Wire & Steel Co., Davenport, Iowa. **F. P. Leahey** has been appointed general works manager for the company, and will be in charge of manufacturing plants at Davenport and at Battle Creek, Mich. Mr. Leahey was manager at the Battle Creek plant. **R. J. Kahl** has been appointed manager of the company's Battle Creek plant.

—o—

George McB. Peters, Buffalo, has been appointed district manager for western New York, Geary Stainless Steel Co., Baltimore. **Kenneth F. Vilsack,** Louisville, has been appointed district manager for Kentucky and southern Indiana for the company. Mr. Peters was with Rustless Iron & Steel Corp., Baltimore, and Mr. Vilsack, with Jeffersonville Boat & Machine Co., Jeffersonville, Ind.

—o—

Edmond F. Ducommun has been elected president, Ducommun Metals & Supply Co., Los Angeles, succeeding the late **Emil C. Ducommun.** Other officers elected were: **A. W. Lohn,** executive vice president; **Charles E. Ducommun,** vice president and treasurer; **Wayne Rising,** vice president and general manager; and **Elmer Wall,** secretary and assistant treasurer. Mr. Rising was also elected a director.

—o—

John L. Gillis has been appointed head of the foreign department, Monsanto Chemical Co., St. Louis. He succeeds **Arnold H. Smith,** head of the foreign department for the last year, who has been named representative of the executive committee to consolidate the interests of Monsanto in Australia. Mr. Gillis joined Monsanto in 1933, and left the company in 1944 to become vice president of Johnson & Johnson International, subsidiary of Johnson & Johnson, New Brunswick, N. J. He returned to the Monsanto foreign department last September. Mr. Smith joined the firm in 1922, in the Rubber Service Laboratories in Akron. He served with Monsanto in England from 1930 to 1940, was petroleum chemicals sales manager in St. Louis for the next 4 years, and became director of the foreign department in October, 1945.

H. M. DAWSON

Appointed managing director, Jessop Steel International Corp., subsidiary of Jessop Steel Co., Washington, Pa., STEEL, Nov. 11, p. 132.

—o—

Charles F. Codrington has been promoted from assistant to the manager to sales manager, blower and compressor department, Allis-Chalmers Mfg. Co., Milwaukee, succeeding **A. E. Caudle,** resigned. Mr. Codrington joined the company in 1930. He served in the engine and condenser department for some time before becoming associated with the blower and compressor department in 1935. During work on the Manhattan project, he was in charge of blower and compressor activities at the company's Hawley plant in Milwaukee.

—o—

Howard J. Jones has been appointed manager of industrial relations, Colorado Fuel & Iron Corp., Denver. For the last 12 years he was with Republic Steel Corp., Cleveland. **Horace J. Jones** has been appointed manager of industrial engineering for Colorado Fuel & Iron Corp. He had been with Republic Steel Corp. for 29 years.

—o—

Joseph P. Simon has been appointed manager, Philadelphia district office, Cutler-Hammer Inc., Milwaukee, succeeding the late **D. J. Quammen.** Mr. Simon will have direct charge of all company sales in the Philadelphia territory, and will have supervision of the firm's branch offices in Baltimore, Washington, and York, Pa. He has been a member of the Philadelphia district office sales force for more than 17 years.

—o—

Howard Coonley, chairman of the executive committee, American Standards Association, New York, has been elected president of the new International Organization for Standardization, the formation of which has just been completed by delegates from 25 nations meeting in London. **Gustave L. Gerard,** staff president of the Belgian Standards Association, has been named vice president of the new organization. Headquarters will be set up shortly in Geneva, Switzerland.

—o—

Joseph S. Parry has been appointed eastern district industrial manager, Westinghouse Electric Corp., Pittsburgh. He will direct the sale of electrical equipment to industries in New York, northern New Jersey and northeastern Pennsylvania. Mr. Parry joined Westing-

GEORGE P. TORRENCE

Who has been named president, Link-Belt Co., Chicago, noted in STEEL, Nov. 11 issue, p. 136.

J. B. AUSTIN

Appointed director, Research Laboratory, Kearny, N. J., United States Steel Corp. of Delaware, STEEL, Nov. 11 issue, p. 134.

WALTER S. PRAEG

Who has been elected president, National Broach & Machine Co., Detroit, noted in STEEL, Nov. 11 issue, p. 132.

house in 1920, and had been manager of the firm's Newark, N. J., office since 1941. **C. Swan Weber** has been named to succeed Mr. Parry as manager of the Newark office. Mr. Weber has been with Westinghouse since 1928. **Richard M. Wilson** has been appointed manager of the company's Washington office. Mr. Wilson joined Westinghouse in 1936.

—o—

Harry G. Smith has been named to the Engineering Division, Ford Motor Co., Dearborn, Mich. He will be in charge of engine design, development and production refinement. In earlier years he was associated successively with Hudson, Marmon and Studebaker in a design capacity. He joined Buick in 1931, and had charge of Buick engine design since 1936.

—o—

E. A. Bertram has been appointed manager, Industrial Division, National Radiator Co., Johnstown, Pa. Mr. Bertram had been in charge of the company's New York Industrial Sales Division. Before joining National Radiator Co., he was chief engineer, Heat Exchange Division, Lummus Co., New York, and was general manager, Heat Transfer Products Inc., New York.

—o—

Blake M. Loring, senior metallurgist, U. S. Naval Research Laboratory, Washington, has been named chairman of the research committee, Brass & Bronze Division, American Foundrymen's Association.

OBITUARIES . . .

Orville Smith, 64, vice president, Gas Machinery Co., Cleveland, died in that city, Nov. 10. Mr. Smith, an attorney, had been counselor for the company for several years, and had been vice president for the last 3 years. He was at one time judge in the court of common pleas, Henry County, O.

—o—

Walter A. Ridings, president, Porter-Cable Machine Co., Syracuse, N. Y., died recently.

—o—

Herbert H. Wright, 66, sales manager, Universal Gear Corp., Indianapolis, died recently in that city.

—o—

David Frame, 70, one of the foremost figures in the iron and steel industry in Ireland, died recently in Dublin. In 1902 he took over Strong's Foundry, which later became Hammond Lane Foundry. He later founded Irish Steel Ltd., Cork, and Solus Teoranta, Bray, County Wicklow.

—o—

George H. Manlove, associate editor of STEEL, died of a heart attack at his home in Lakewood, O., Nov. 10. Mr. Manlove had been with the Penton Publishing Co., publisher of STEEL and other business magazines, since 1913. In his youth he had prepared for a medical career, and graduated from Hahnemann Homeopathic Medical College, Philadelphia. As a young man, however, he decided to become a newspaperman and was associate editor of the *Rockford (Ill.) Star* prior to joining the Penton organization in 1913. His first position with Penton was as Chicago district editor of STEEL, then known as IRON TRADE REVIEW, and a sister publication, *Daily Metal Trade*. After 10 years in Chicago he was transferred to the home office in Cleveland in 1923, and had been active on the staff of STEEL until his death. He was a member of several professional and civic organizations, and was co-author of the book, *Scrap Metals*.

GEORGE H. MANLOVE

—o—

John Knutson, 56, who was construction superintendent during the war at the shipyards of Froemming Bros. Inc., Milwaukee, died recently in that city.

—o—

John J. Kane, 63, general patent attorney, Allis-Chalmers Mfg. Co., Milwaukee, died recently in that city. Mr. Kane became head of the company's patent department in 1944.

—o—

Frank J. Hearty, former president, F. J. Hearty & Co., San Francisco, and west coast representative of Edward Valves Inc., East Chicago, Ind., died recently.

—o—

J. Truman Evans, manager, locomotive sales department, Vulcan Iron Works, Wilkes-Barre, Pa., died recently.

INERT

. . . is applicable to a wide range of metals. Its advantages include elimination of flux, stability of chemical composition of molten metal and ability to weld magnesium and its alloys in virtually all thicknesses

By D. W. PUFFER
Thomson Laboratory
West Lynn Works
General Electric Co.
West Lynn, Mass.

Fig. 1 — Manual helium-shielded-arc welding being done on light-gage magnesium plate

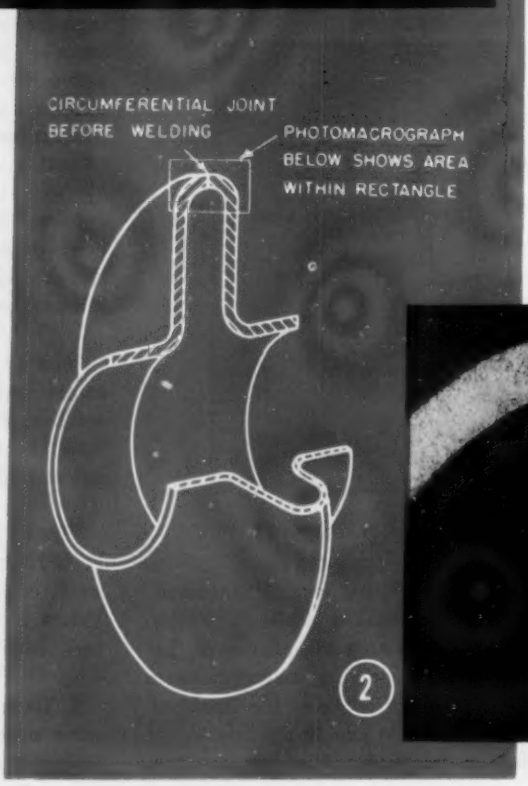


Fig. 2 — Expansion joint with 90-degree pie section removed. Flexing load applied to such a joint requires smooth cross section at location of weld so failure due to stress concentration will not occur. A representative cross section of welded joint is shown in the photomacrograph

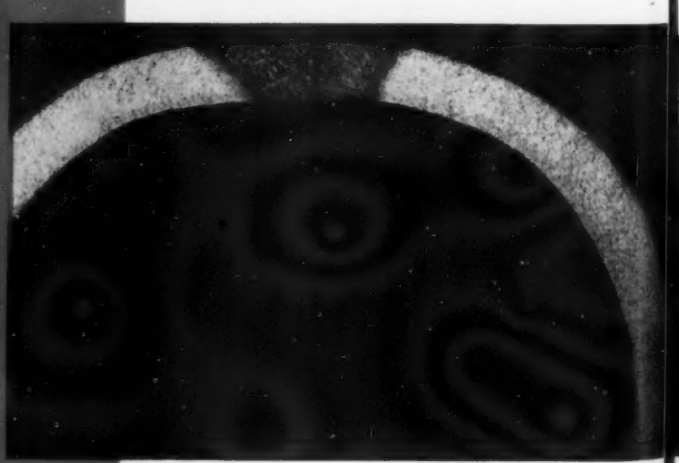


Fig. 3 — Photomacrograph shows penetration achieved with inert arc process in a single square groove weld of 13/16-in. 14 ST aluminum alloy

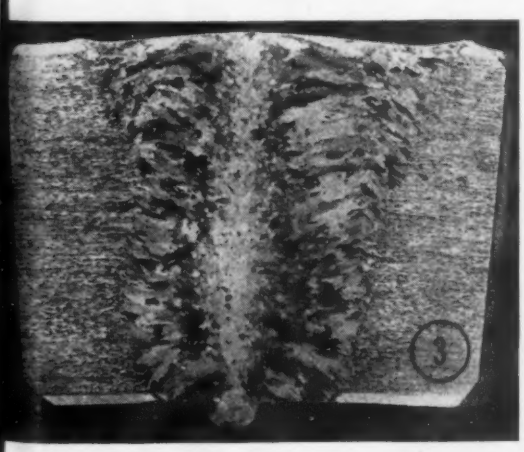
...t Arc Welding

PROCESS of inert arc welding consists essentially of melting a localized area of one or more pieces of metal under a protective envelope of an inert gas such as argon or helium. Melting action is accomplished by the heat generated by an electric arc established between a non-consuming electrode, usually tungsten, and the metal being welded.

No chemical change of the molten metal occurs during welding because the surrounding atmosphere of inert gas is chemically inactive. Consequently, this process is less likely to produce either an increase or decrease in carbon content, hydrogen embrittlement or oxidation in the resulting weld metal. Fig. 1 illustrates the inert arc welding process in action. Operator is manually welding magnesium and the similarity of the technique to that of gas or atomic hydrogen welding is evident. Welding may be done with or without the addition of filler metal, depending upon the particular application.

About the same degree of distortion is encountered with the inert-arc process as that resulting from metal arc welding. Tests have indicated that less distortion occurs with the inert-arc process than when using either the atomic hydrogen or gas welding processes. One reason for this difference is that with the inert arc process, no secondary heat is added to the base material by a flaming envelope which surrounds the source of welding heat. This secondary heat usually acts to increase distortion, and is especially noticeable in the case of thin materials.

It is not necessary to use flux when welding carbon steels, austenitic stainless steels, magnesium, copper, aluminum and high nickel-chromium alloys with the inert arc process, providing the proper inert gas welding current polarity combination is used. Accompanying table lists the inert gas-welding current polarity combinations that have been found to be satisfactory for use with the above base materials.



Elimination of the need for flux is extremely desirable because, in many cases, its presence during welding may cause reactions to occur which may eventually be detrimental. For example, if any flux is left on or in a welded joint in aluminum or magnesium or their alloys, severe corrosion may occur after a time and cause failure of the joint. Metal and inert gas backing have been found to be satisfactory for use in cases where the back side of welds, susceptible to oxidation, need protection. It has not been recommended that flux be used as a backing medium, for the reasons previously stated.

Surfaces of materials to be welded using the inert arc process should be reasonably clean before welding. In general, cleaning can be accomplished by the usual mechanical or chemical methods that have been proved to be satisfactory for atomic hydrogen or gas welding.

Aluminum and its alloys present a different problem of surface preparation than the other materials mentioned above because a layer of oxide, which is harmful to the weld, forms so rapidly that it must be removed *during* welding. This can be accomplished in two ways when using the inert-arc process: (1) By the use of flux and (2) by the use of alternating current with argon gas. Obviously, the second method is preferred because, as mentioned before, it is not good practice to use flux.

Removal of an oxide film from aluminum by the use of an alternating current supply of welding current and argon gas may be more readily visualized by considering what happens during each alternating current half cycle. Since the duration of each half cycle is extremely short, being only 1/120-sec in the case of a 60-cycle supply. it is difficult to study the action that occurs. However, investigation indicated that this short time could be increased to essentially any desirable amount by using first one direct-current polarity and then the other. In this way it was found that if direct current, electrode positive, were used, the electrode consumption was high and very little weld penetration was achieved, although the surface of the weld was clean. If direct current, electrode negative, were used, a very dirty condition was obtained throughout a deeply penetrated weld.

Reason for this polarity relationship may be more clearly understood if an analysis occurs in each case. When the electrode is positive and the work is negative, electrons travel to the electrode and the positive argon ions travel to the work. The argon ions have considerable mass and hence acquire large amounts of kinetic energy

INERT GAS-WELDING CURRENT POLARITY FOR VARIOUS BASE MATERIALS

Material	Inert Gas	Welding Current	Remarks
Magnesium and Alloys	Helium	dc electrode (+)	All thicknesses
Magnesium and Alloys	Argon	ac electrode	Medium and Heavy Sections
Aluminum and Alloys	Argon	ac electrode	All thicknesses
Austenitic Stainless Steels	Argon	dc electrode (−)	*Light sections
Austenitic Stainless Steels	Helium	dc electrode	Medium and Heavy Sections
High Nickel-Chromium Alloys	Argon	dc electrode	*Light sections
High Nickel-Chromium Alloys	Helium	dc electrode	Medium and Heavy Sections
Copper	Helium	dc electrode	All thicknesses

* Argon is preferred to helium when welding light sections because the arc voltage is lower and, consequently, for a given value of welding current, less heat energy is developed by the arc. This means that more stable operation may be had when welding light sections with the argon-shielded arc because:

a) A variation in welding current produces less change in the heat energy of the arc.

b) Higher values of welding current may be used for the same heat input and this makes the arc easier to strike.

Above materials can be welded using listed combinations of inert gas and welding current polarity without use of any flux.

while speeding to the aluminum. When these argon ions collide with the aluminum, they clean it by virtually tearing away particles of aluminum and aluminum oxide in a manner similar to grit blasting.

The ions produce relatively little heating of the base material however, and as a result, the amount of penetration is slight. If the polarities are reversed, the ions travel to the electrode and exert no cleaning action on the aluminum, while the electrons bombard the material being welded and produce considerable heat and weld penetration.

Alternating current by virtue of its reversing polarities includes both the cleaning and heating effect in one cycle. The time between cleaning cycles is only 1/120 sec and apparently this interval is short enough so that the harmful layer of oxide does not have time to form. Thus, using an alternating current supply, it is possible to obtain a clean weld having a reasonable amount of penetration. It should be pointed out again, for emphasis, that aluminum and its alloys should be thoroughly cleaned before welding, as well as during welding.

Some limitations on the use of alternating current exist because rectification occurs across the arc. (There is some evidence to indicate that this rectification may be due to a point-plane effect.) A rectified component as large as 170 amp, dc, has been measured when using 570 amp, ac.

Rectification, as used here, means that a portion of one half cycle of the impressed alternating current is prevented from flowing. The half cycle that is suppressed is the one where the electrode is positive. This means that the cleaning action of the argon ions is not realized completely and the resulting weld is dirty.

It has been found that satisfactory results can be obtained if the rectified component is "bucked out" by an additional direct-current supply and that four, 6-v, 100 amp-hours storage batteries connected in parallel and the combination placed in series with the arc, sufficiently bucked out the rectified component and carried the welding current of approximately 550 amp without overheating. The circuit arrangement used is shown in Fig. 6.

Equipment: Fig. 5 illustrates the equipment used for manual inert arc welding using a direct-current source of welding current. The "bottle" of inert gas is shown on the right and is equipped (*Please turn to Page* 116)

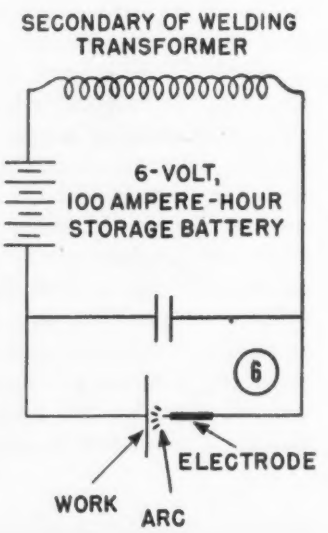


Fig. 4—Gas-shielded arc-welding electrode holder, type WGS, consisting of handle with 10-ft cable and hose assembly, and electrode clamp

Fig. 5—Gas-shielded arc-welding apparatus arranged for use with type WGS electrode holder

Fig. 6—Circuit arrangement to overcome rectification when using an alternating-current supply for welding

Seen and Heard in the Machinery Field

By GUY HUBBARD
Machine Tool Editor

PRODUCTION FOR SALE: A recent issue of the *Cleveland Plain Dealer* carried a full-page advertisement by War Assets Administration. This displayed the following head and subhead: "Prices Cut on 31 Types of Government-Owned Surplus Machine Tools; Buy at new low fixed prices—No limit on quantity—Immediate sale and delivery."

In the copy was cited a typical case of the many bargains available. A production machine which cost $7054 when originally purchased, and whose previous WAA price had been $4091, now was being offered for $2045.

This advertisement aroused my curiosity because of its mixture of bargain sale psychology and business-like presentation of equipment available and procedure involved. I decided to go out to the former Fisher Bomber Plant, near Cleveland Airport, to get first-hand information as to what this was all about.

Without comment on the drastic price cuts on certain machines in so-called "long supply", I must admit that I found the big sale in the hands of capable people and so set up that it was operating with surprising efficiency. I say "surprising efficiency", because of the fact that—like everybody else who is interested in the machine tool industry—fantastic tales of inefficiency in surplus disposal previously had come to my ears.

To get the feel of this big sale, I had myself processed through as a prospective purchaser. After being directed to headquarters by courteous guards (mark that word "courteous"), I was registered by a receptionist, was given a 160 page catalog of machines and tools available and was assigned a seat in a comfortable reception room. This "Site Sale Catalog" covering $4,500,000 worth of equipment really is a very good piece of work. Of course it is difficult to get much of a description of a modern production machine tool into two or three lines running lengthwise of an 8½ x 11 in. page. However, make, size and type, and unit sales prices are given, together with number available and key numbers to the data file and location of the machine or lot on the floor.

After a short wait, an interviewer (likewise intelligent and courteous) came to see me. By that time I had selected from the catalog certain machines which I wished to inspect on the floor. A guide immediately was assigned to me. He turned out to be a young ex-marine who had participated in the landing operations at Iwo Jima. He knew his way around the huge bomber plant.

Memories of 1935 Show Revived

The extensive storage and inspection areas in the Bomber Plant reminded me very much of the 1935 National Machine Tool Show as it was about two days before that memorable show opened—except that conditions in the Bomber Plant were far more orderly and far less hectic than they were in the Cleveland Public Auditorium back in the Fall of 1935. I speak from experience. I was uncrating and setting up an exhibit of automatics at that time.

Getting back to the present, my guide quickly located the machines in which I had expressed interest. He did it by numbers and symbols painted on pillars along lines followed in big Ordnance warehouses.

The machines to which I refer were heavy duty turret lathes and precision boring machines. They were heavily skidded and although coated with a thin layer of slushing compound, they were not by any means in the "mummified" condition in which rumor had led me to expect. They were neatly arranged for easy and relatively complete inspection.

They were in good shape. I would say that they were real bargains. I was almost tempted to become a real—rather than an imaginary—purchaser. Had I purchased them, it could have been done on the spot with minimum of red tape and they immediately would have been crated and delivered, either by rail or by truck. Shipping facilities at this particular depot are excellent.

By the time I got back to headquarters, operations were going full blast. A steady stream of customers was going through registration, a large number of preliminary interviews were under way, guides were being assigned and a big staff of salesmen were writing up the orders. As fast as sales were made, they were written up by key numbers on a blackboard facing the reception room so that prospects there could cross them out in their catalogs. In the two hours since I had arrived, a long list of numbers had appeared on that blackboard—indicating rushing business.

After having been "through the mill", I had a visit with B. W. Henn, WAA field director for this sale, and also with some of his top men. They all know a lot about machine tools. They know that they have a tremendous job to do. No one seems to know exactly how big it is or how long it will take.

Obviously General Littlejohn is cracking the whip in Washington for more speed. Unquestionably General Littlejohn in turn is being urged on by higher powers. The machine tools themselves belong to you and to me and to every other taxpayer. They are much needed in industry right now. They represent "production for sale", when production is needed as never before.

Their value will grow less as time goes on. As "durable goods" machine tools are not by any means as durable as generally is believed. It is not good to have them standing around. It is physically bad for the machines themselves. Idle machines—like idle men—represent production lost forever.

If this reservoir of machine tools can be drained into industry quickly but without releasing a destructive torrent, that probably will be best for all concerned. What I saw at the Cleveland Bomber Plant looked more like controlled release through an emergency sluice gate than it did like an uncontrolled, destructive torrent.

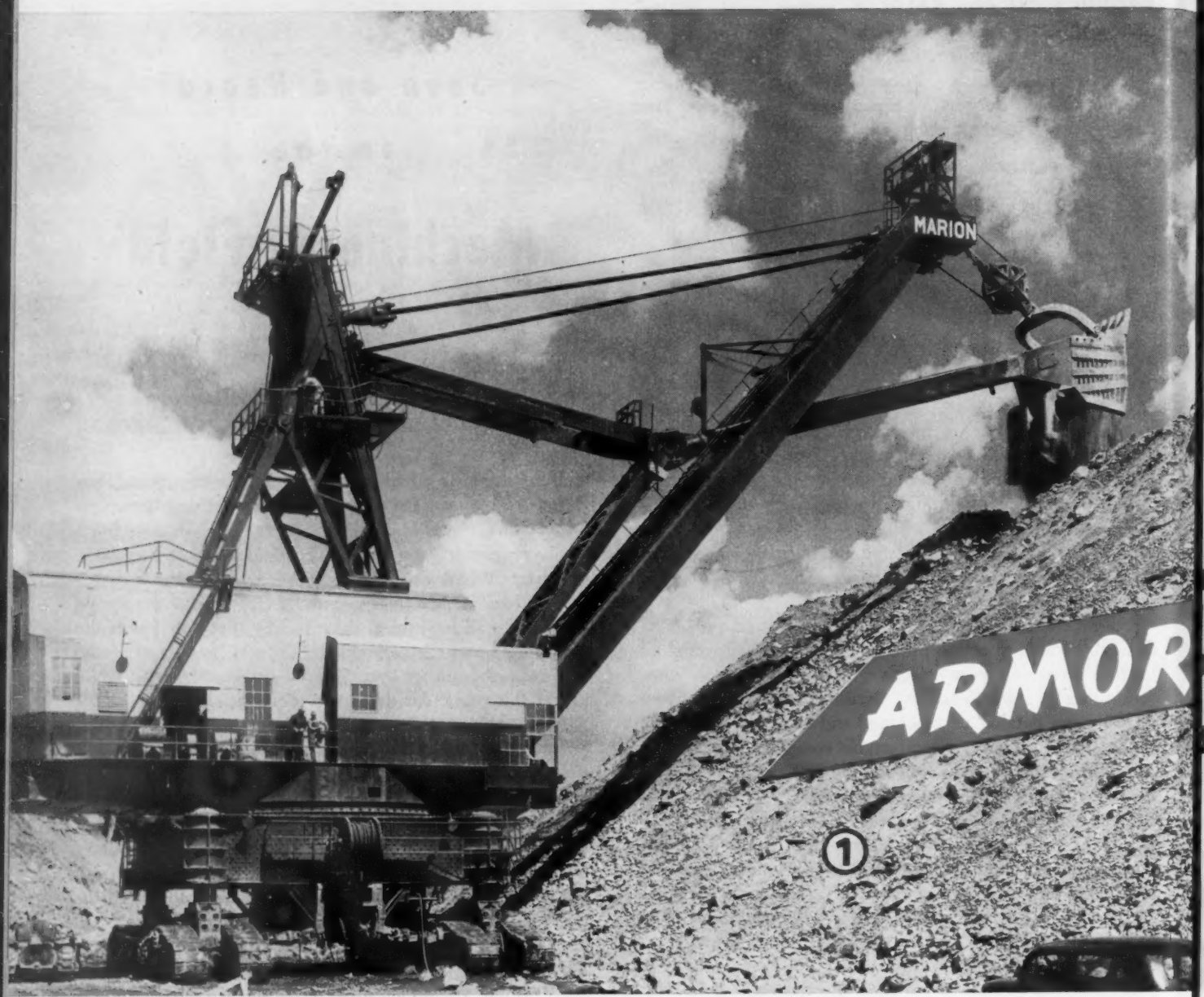


Fig. 1—Huge coal stripping shovel equipped with 40 cu yd dipper strips overburden ranging up to 80 ft in depth. Capable of dumping its load on top of a seven-story building, the machine can scoop up enough earth at one bite to fill a room 10 x 12 x 9 ft

Fig. 2—Shop view of the 40 cu yd dipper showing all-welded construction

NEW armor plate steels developed in World War II are clearing the way for many new industrial applications where the ratio of weight to tensile strength and resistance to abrasion is a controlling factor.

One of the first of the new applications to attract widespread attention is the development of a new 40 cu yd coal stripping shovel dipper by Marion Power Shovel Co. of Marion, O. The new dipper, said to be the largest in the world, owes its development primarily to the performance characteristics of the new war-born steels.

The first of a group of 40 cu yd dippers being built by Marion was placed in service early in September on a Marion type 5561 coal stripping shovel owned by Hanna Coal Co., operating near Georgetown, O. Up to that time, the machine carried a 35 cu yd dipper.

On the basis of preliminary experience with the new dipper and handle combination, Hanna officials reported they are pleased to note that the increased yardage capacity was achieved without imposing any additional weight on the machine and without slowing the cycle time. They added that the machine seems to have a trifle more power and possibly a bit more speed with the 40-yd dipper.

Evidences of a power improvement were no surprise to Marion engineers who for months had been "building" the giant dipper and its newly-designed handle on paper. By taking full advantage of the higher physical properties of war-developed steels, they lightened the dipper weight some 15,000 lb. By using the new steels in combination with a new handle design, they took off another 15,000 lb. Since the extra 5 cu yds of earth the big dipper will pick up in comparison with its 35 cu yd predecessor weighs only 15,000 lb, it becomes obvious that a net gain was achieved in the weight-radius factor. Furthermore,

Critical weight-capacity ratio factor is reduced from 4000 to 2100 lb per yard by use of low alloy high tensile steels. All-welded 40 cu yd dipper is of advanced design

R PLATE STEELS

ed in Huge Coal Stripping Dipper

the net reduction in weight passes benefits on to other parts of the machine.

To appreciate the full significance of this development, it is necessary to go back approximately 10 years and review briefly the developments of the mid-30's which brought about the gradual elimination of the old-time heavy cast dippers. Their weight-capacity ratio was in the neighborhood of 4000 to 4500 lb per yard, and since the weight-radius factor is a critical one in power shovel manufacture, this weight was at its worst possible location on the machine—at the point farthest from the center of rotation.

A decade ago, the era of welded low alloy high tensile steel shovel dippers began. It was made possible by the development of such steels as Manten and nickel-copper steel by Carnegie-Illinois Steel Corp.; manganese-moly structural steel and Jal-ten by Jones & Laughlin Steel Corp.; R.D.S. by Republic Steel Corp.; Yoloy by Youngstown Sheet & Tube Co.; Otiscolloy by Otis Steel Co.; Mayari-R by Bethlehem Steel Co.; Inland Hi-Steel by the Inland Steel Co.; N-A-X by Great Lakes Steel Corp., and other steels of similar characteristics.

Application of these steels to the manufacture of power shovel dippers was accompanied by sufficient advances in the design of welded structures to reduce the weight-capacity ratio of shovel dippers to a range of 2500 to 3000 lb per yard—a big reduction from the 4000 to 4500 lb per yard ratio of the era of heavy cast buckets.

Development of the new 40 cu yd may well be the start of a new era of shovel dippers as significant as the one that began a decade ago, for in the new dipper the weight-capacity ratio has been reduced to 2100 pounds per yard —substantially a "ton per yard" ratio, since the big dipper frequently carries a 45 cu yd load that is far above its rated capacity. The weight-capacity ratio of little more than a decade ago has been halved.

At least four steels are available at the present time making possible the performance attained in the big dipper. These low alloy high tensile sheets and plates, stemming from armor plate developments during the war, are produced by Carnegie-Illinois; Great Lakes Steel; Jones & Laughlin and Jessop Steel Co.

These postwar steels, alloyed a bit more and/or heat treated, posed many new problems of fabrication and processing plus the all-important problem of serviceability in the field. The new steels, for example, could be purchased in the form of fully heat-treated sheets and plates, or could be obtained in untreated form in expectancy of heat treatment of the assembled units after all fabricating and machining had been completed.

While the merits of purchasing treated or untreated steel sheets and plates vary with the unit to be manufactured and scores of other considerations each manufacturer must weigh for himself, Marion chose to purchase fully heat-treated sheets and plates for its 40 cu yd dipper. This choice involved only controlled preheating and post-heating processes so far as heat treatment problems are concerned.

Since the new steels radically changed the old-time situation in which welding rods produced joints equal or greater in strength than the units being joined, an entirely new approach to welding problems was necessary. These

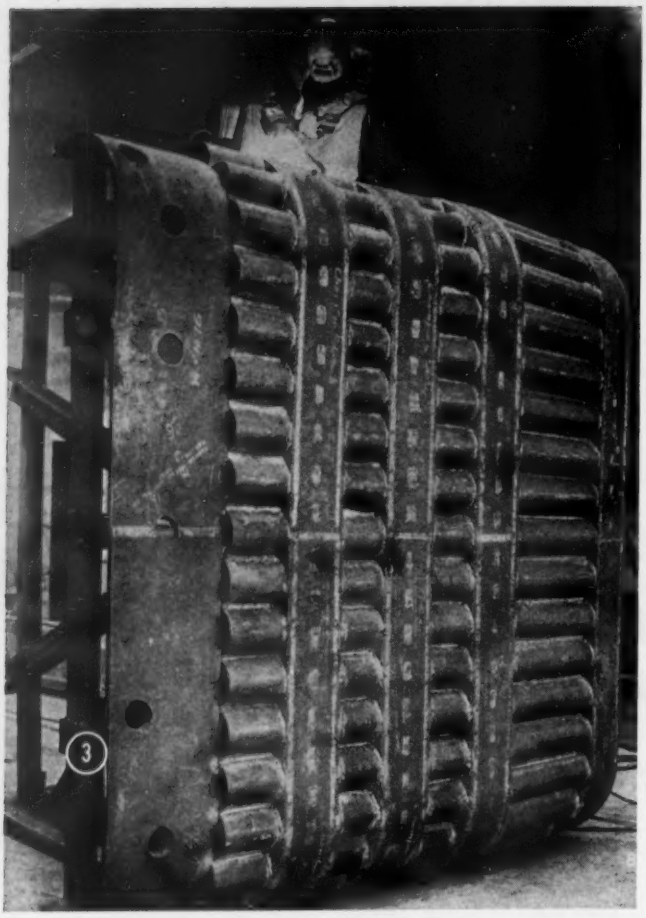


Fig. 3—A welder at work on one of the dipper units

problems were solved by the application of special welding procedures, exacting craftsmanship on the part of the welders and careful attention to the characteristics of the new steels and new war-developed electrodes. The new rods required to produce joints equal or superior in strength to the new steels must approximate an E-9010 rating, American Welding Society classification. The majority of the welding rods used in the fabrication of the first 40 cu yd dippers were supplied by Arcos Corp., Philadelphia.

Going back to the new steels themselves, it should be pointed out that from an engineering standpoint, it is virtually impossible to make use of all the advantages which might seem apparent from a study of their ratio of pounds per square inch and yield point. This is because a slenderness ratio and lack of rigidity is encountered which might not suggest itself "on paper" but which is nevertheless a problem to be reckoned with. For example, a dipper handle might theoretically have sufficient tensile strength to do its job well, but in a long structure subjected to all manner of strains, a certain bulk is required in the design to assure freedom from whipping or flexing.

Castings are used judiciously in the big dipper and handle assembly, but nevertheless the assembly may be regarded as an all-welded unit since these castings such as the cutter lip and the bearing connections are welded into place.

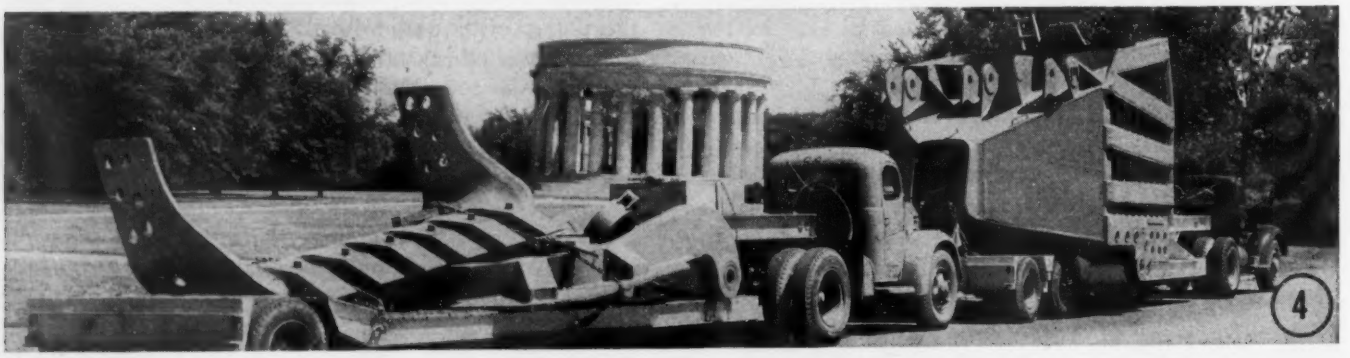
In order to realize fully on the benefits of the increased dipper size it was necessary to pay particular attention to the shape of the dipper so that it would fill properly without delaying the operating cycle. The pitch of the dipper teeth and lip lead the dipper into a full load quickly and easily and as the dipper fills, the contour of the load lends itself naturally to the shape of the dipper. These factors simplify the job of filling the dipper to capacity for each cycle.

The big dipper, in combination with the Marion type 5561 machine, is capable of astounding performance—it can scoop up enough earth at one bite to fill a room 10 x 12 x 9 ft and swing it two-thirds of a city block—240 ft. It can dump its load on top of a seven-story building.

This newest chapter in coal stripping history is a sequel to Marion's revolutionary development of the "knee action" front end in 1940, an achievement in design and construction which shifted the weight of the crowd machinery off the boom and placed it on the gantry almost above the center line of the machine. Thus the crowd machinery, which had been a big item in the weight-radius factor, was virtually eliminated as a front-end weight problem. More important, this design made possible the use of a much lighter weight boom, which in turn made it possible to increase the range of the machine without encountering front-end weight problems. The benefits of this development to the coal stripping industry were immediately apparent, and the era of 35 cu yd machines with long booms and handles suitable for deep overburden really came into its own.

The big machine and its 40 cu yd dipper are used to strip deep overburden from coal veins. In operation 24 hours a day, 7 days a week, it rapidly eats its way through high banks of overburden ranging up to 80 ft. Smaller machines follow the big unit to load the veins of coal which have been laid bare by the stripping machine. The huge machine is powered entirely by electricity, and its power consumption is equal to that of a community of 3000 persons.

Fig. 4—Units of the big dipper on trucks enroute for assembly on the job



Engineering News at a Glance

SHRINK-FITTING IN BUCKETS: The process of shrink-fitting now may be used by plants handling small-lot quantities as a result of a stainless steel outfit originally made up by The Linde Air Products Co., New York, for demonstrating the process. Outfit consists of receptacle, lifter and bucket—all of stainless so strength is retained at the extremely low temperatures used—which may run down to about 320° F below zero. Part to be shrunk is placed in the receptacle of the bucket containing liquid nitrogen. It is then removed and placed in the receiving part where the insert is allowed to return to normal temperature. This causes the insert to expand just enough to obtain a binding fit in the receiving part.

STEEL PLIES FOR TIRES: Through efforts of American Steel & Wire Co., Cleveland, subsidiary U. S. Steel Corp., steel and rubber will be combined in four plies to give heavy-duty tires the strength and durability of about 20 fabric plies. The steel wires—0.0059-in. thick—will help to form the inner core or body of the tire. In producing each ply in the construction of a tire, three fine wires are twisted into a strand. Six of these are laid around a central core to make a cord 1/32-in. in diameter. A number of cords then are placed parallel to each other and coated with rubber. When three or four of these plies are laid, with wires in each running at an angle to the wires in other plies, a strong, flexible foundation is afforded for application of tread rubber.

CONTINUOUS ENAMELING: Coils of light-gage steel directly from the mills may be enameled in a continuous process if the experimental plant of Ferro Enamel Co. in Nashville, Tenn., proves successful. The company is planning to cut sheets coming from the finishing furnace in standard lengths. These will be used as wall panels for both interiors and exteriors of buildings.

BINDING "BITS": Because of its exceptional heat-stability, waterproofness and excellent dielectric properties, a thermosetting resin referred to as DC 2103, developed by Dow Corning Corp. of Midland, Mich., has many uses other than as a bonding agent for inorganic fabrics in the production of rigid electrical laminations. It can be used as the resin binder in producing a heat-stable and waterproof cement for sealing light bulbs or radio transmitting tubes to metal bases. It also can be used for bonding finely divided particles such as powdered metals, carbon, carborundum, silica or mica in the fabrication of a wide variety of products including friction producing materials.

BACKWARD MOVEMENT: New automobiles are rolling off one company's assembly lines backwards this year. The innovation was prompted by design changes in Studebaker's 1947 models. Tests according to the South Bend, Ind. company, show that workers can do their jobs easier and more efficiently by following, rather than backing away from the cars as they move down the lines. Multiple final assembly operations around the front end of the vehicle are easier to handle by the new system, company engineers say. Threading of the steering column is much simpler now that the chassis moves into the body instead of the reverse.

STAINLESS AND BEAUTY: Milady's frequent visits to the beauty shop are getting to be of definite interest to many producers of stainless steel. In designing equipment for beauty centers, a high degree of sanitation must be provided. Equipment must be attractive and easily cleaned which explains why a heavy demand for stainless is coming from beauty equipment manufacturers. According to a survey reported by Chicago Steel Service Co., Chicago, about $25,000,000 will be spent this year on new equipment, if available. Bulk of this will involve stainless steel. One of the world's largest manufacturers of beauty shop equipment uses stainless for heaters, clips, spacers and similar devices.

LITHIUM IN BEARINGS: German manufacturing combine for several years utilized lithium metal in the production of railroad bearings and in copper alloys, according to a publication released by the Bureau of Mines, Washington. Metalurgists in Germany also conducted studies in the preparation of lithium, cadmium and lithium-aluminum alloys, and attempted to use lithium metal as a degasifying agent in radio tubes.

DOUBLE DUTY: Generator that produces both alternating and direct current is incorporated in the postwar diesel-electric locomotive developed at La Grange, Ill. by Electro-Motive Division of General Motors Corp. The unit produces sufficient alternating current to operate accessories and auxiliaries and still produces the rated horsepower—1500—in direct current for train propulsion. Because of this, auxiliaries and accessories are driven by separate alternating-current motors. This also made it possible to regroup and relocate equipment in the most advantageous places as they do not have to be hooked up mechanically with the engine.

PLASTICS AND PLANERS: Nonmetallic table way developed by G. A. Gray Co., Cincinnati, is reported to reduce cutting and scoring to a minimum. Bearing surfaces of this table way consist of laminated plastics produced from fabric impregnated with Bakelite phenolic resins. The laminated plastic plates are secured to the table by laminated plastic pins. In tests, one planer table with phenolic laminated plastic ways was used continuously day and night for over a 2-year period. Although used for the heaviest of work with a normal return speed of 380 fpm, the planer showed no evidence of wear. In another test, the plastic ways remained unaffected even at high speed operation when subjected to a load of 50 tons.

SELECTIVITY COUNTS: Selection of unit heaters to fit the plant or process is just as important as selection of the proper machine for a given part in the production line. Competitive heating units claiming large Btu per dollar value do not meet all requirements, according to D. J. Murray Mfg. Co. The Wausau, Wis. concern states that large volume of air handled, together with the lower outlet temperature, and the construction of the unit itself, should be deciding factors in selection. The greater number of air-changes in a given space, the greater the heatload economy. Excessive temperature at the outlet of the unit heaters means buoyancy increase in air. This results in rapid rise of heated air to the ceiling, in turn, high ceiling temperatures stratification and excessive heat loss. Also, it means an inefficient and expensive heating system.

"SHOES" FOR SHUTTLE CARS: Two-way traction, round shoulders and extra thick sidewalls to protect it from sagging and cutting are among the features incorporated by B. F. Goodrich Co., Akron, in a new pneumatic tire developed for shuttle cars used in underground mine service. According to the rubber company, maximum load for the tire at 5 mph is 4340 lb, at 10 mph 3880 and at 30 mph 2530 lb.

This article, concerned chiefly with problems arising in attempts to harden heavy cast steel sections completely, is based on work done for the Office of Scientific Research and Development under Contract OEMsr-450 with Battelle Memorial Institute

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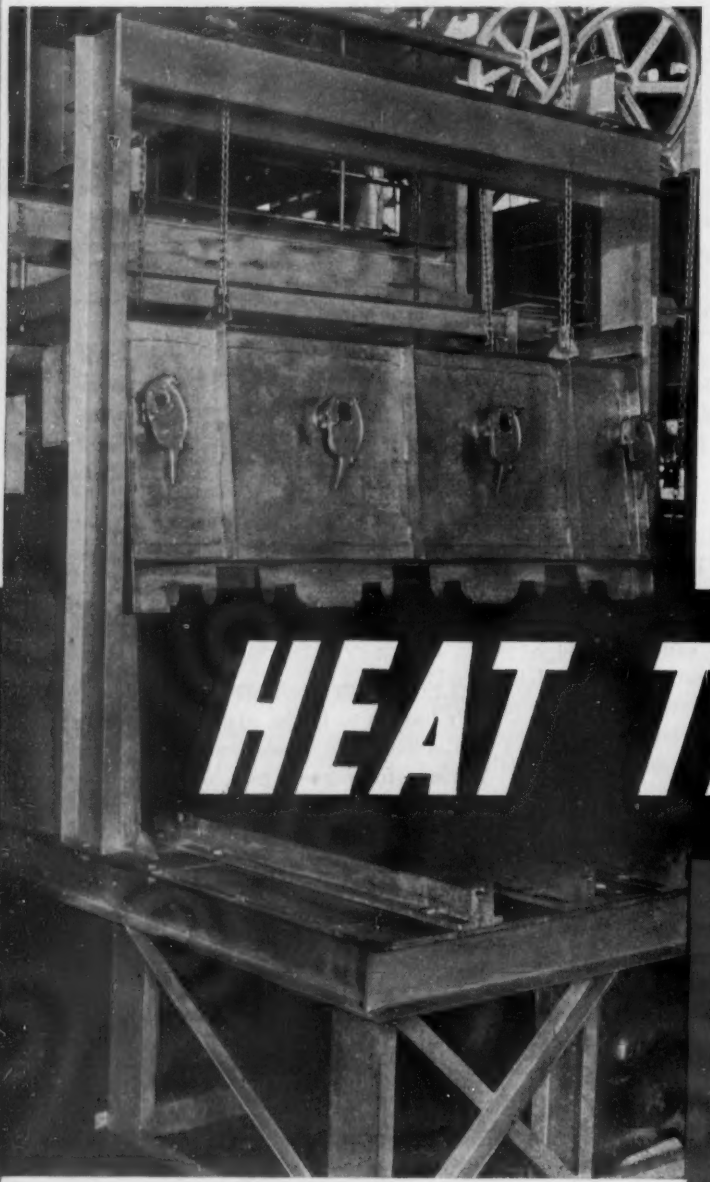
HEAT TREATMENT

PRIOR to the war, heavy cast steel sections, of 6 in. or more in thickness, were commonly used only in the as-cast or in the as-annealed condition. Such castings possessed fairly good ductility but rather low tensile and yield strengths. During the war, limitations of weight and the concurrent increase in unit stresses made it necessary to consider the use of quench and draw treatments for heavy castings as a means of obtaining an increase in the hardness, tensile strength and yield strength without loss of toughness and ductility.

Drawn martensite has been proved, at least for medium and low-carbon steels, to give the best combination of strength and ductility. For a given tensile strength or yield strength, the elongation or reduction of area of tempered martensite is superior to the elongation or reduction of area that can be obtained from a structure consisting of either pearlite or bainite or mixtures of these two transformation products. Conversely, for a given elongation or reduction of area, the tensile strength or the yield



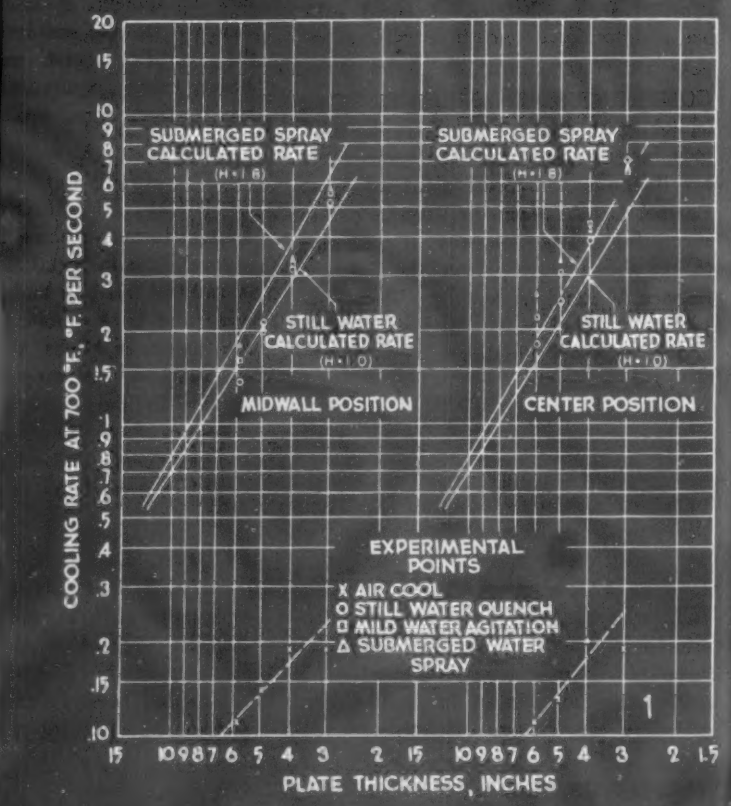


Fig. 1—Experimental and calculated cooling rates at center and midwall position of plates 3 to 6 in. thick at 700 F

Fig. 2—Similar cooling rates at 1000 F. Cooling rate at center of 6-in. plate is more than ten times faster during water quenching than during air cooling

Fig. 3—Cooling rates of plates at 1300 F

strength that can be obtained from tempered martensite is greater than that which can be obtained from either pearlite or bainite.

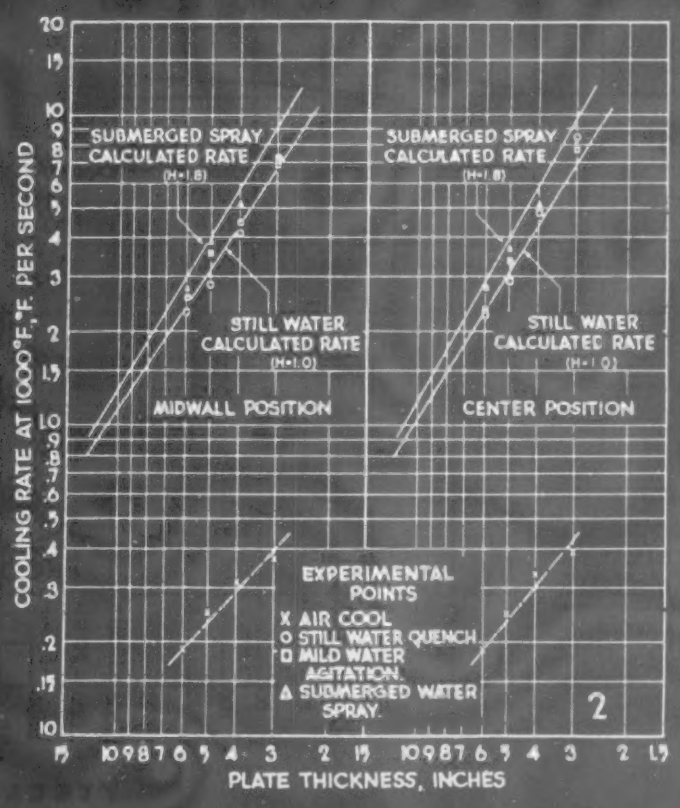
In some instances, it is sufficient that heavy sections have only an exterior shell that is fully hardened. Interior portions of these castings may, without detriment, be mixtures of higher temperature transformation products, i.e., bainite, ferrite, and pearlite. This is true for parts where high stress occurs only at or very near the surface, and it becomes simply a matter of saving the surface and saving all. The problems of heat treating such massive castings, which demand only a shell of martensite at the exterior, are very similar to the problems of fully hardened lighter sections.

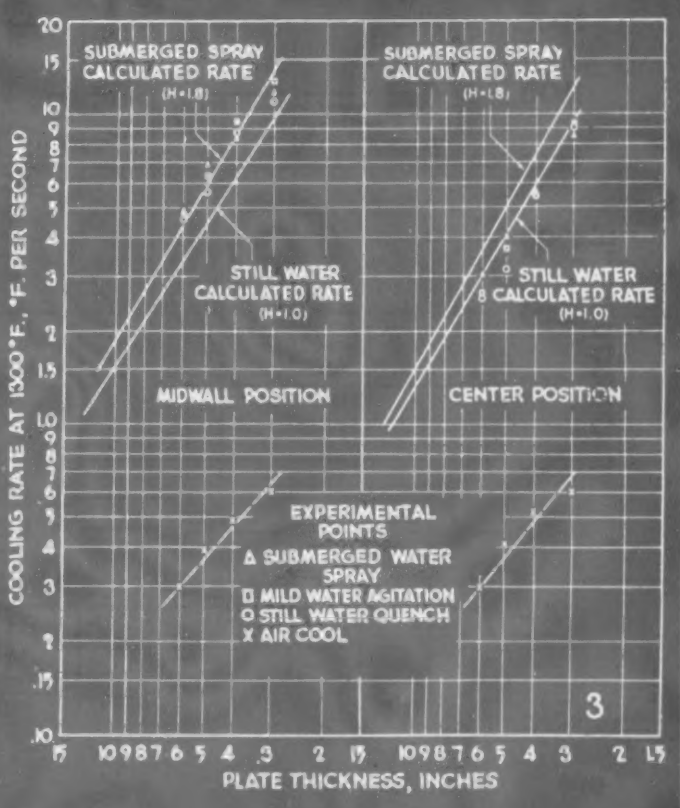
In other heavy sections, it can be demonstrated that only fully hardened and drawn parts will result in the optimum service life. In these parts, service conditions are such that the triaxial stresses imposed well below the surface produce nearly as severe a condition as the biaxial stresses that occur at and near the surface. For example, highly stressed shafting which is subject to both a severe torque and a severe bending moment may, if hardened only at the surface, fail in such a way as to indicate that the fracture originated well below the tempered martensite zone and within the incompletely hardened area. If such parts are hardened throughout and then tempered, improved life results. The complete hardening from surface to center of such heavy parts imposes problems which are not commonly encountered in lighter parts. The present paper is chiefly concerned with the problems which arise in attempting to harden heavy sections completely.

Heating and Cooling Rates of Heavy Plate: One of the early questions that arose was whether it was worthwhile to attempt to water quench sections of 6-in. thickness or more. Water quenching produces severe stress near the surface, and if at the center air cooling results in almost as rapid a cooling rate as water quenching, then it might be advantageous simply to adjust the alloy content so that air cooling would produce complete hardness and thus avoid the high stresses set up near the surface and the corners during water quenching. The cooling rates at the center and midwall (halfway between the center and surface) position of plate of 3 to 6-in. thickness were obtained experimentally and are indicated in Figs. 1, 2 and 3. These experimental rates were compared with rates calculated from data published by Austin and originally determined by Russell.[1]

First it may be noted that the experimental and calculated cooling rates agree quite well. Second,

T of heavy cast steel sections





a large difference in cooling rate exists between the center cooling rate of heavy plates that are air cooled and water quenched. For example, at 1000 F the cooling rate at the center of 6-in. thick plate is more than 10 times faster during water quenching than it is during air cooling. Third, it is evident that there is only a small difference between the rate of cooling in the midwall position and the rate of cooling in the center position on heavy plates that are water quenched.

The heating cycles of these same plates were determined and are shown in Fig. 4. Heating was carried out in a large electric furnace with the furnace equalized at 1650 F before introducing the plate. The power input of the furnace was sufficient that the furnace atmosphere, as indicated by the furnace thermocouple, came back to 2650 F within a few minutes after introduction of the plate into the furnace. The results indicated a considerably faster rate of heating than is suggested by the old rule of thumb that one should heat heavy sections one hour for every inch of thickness. The results also indicate that there is only a minor temperature gradient between the surface and the center of the plate. Even in the 6-in. block, this was not more than 150 F at any particular time during the heating cycle.

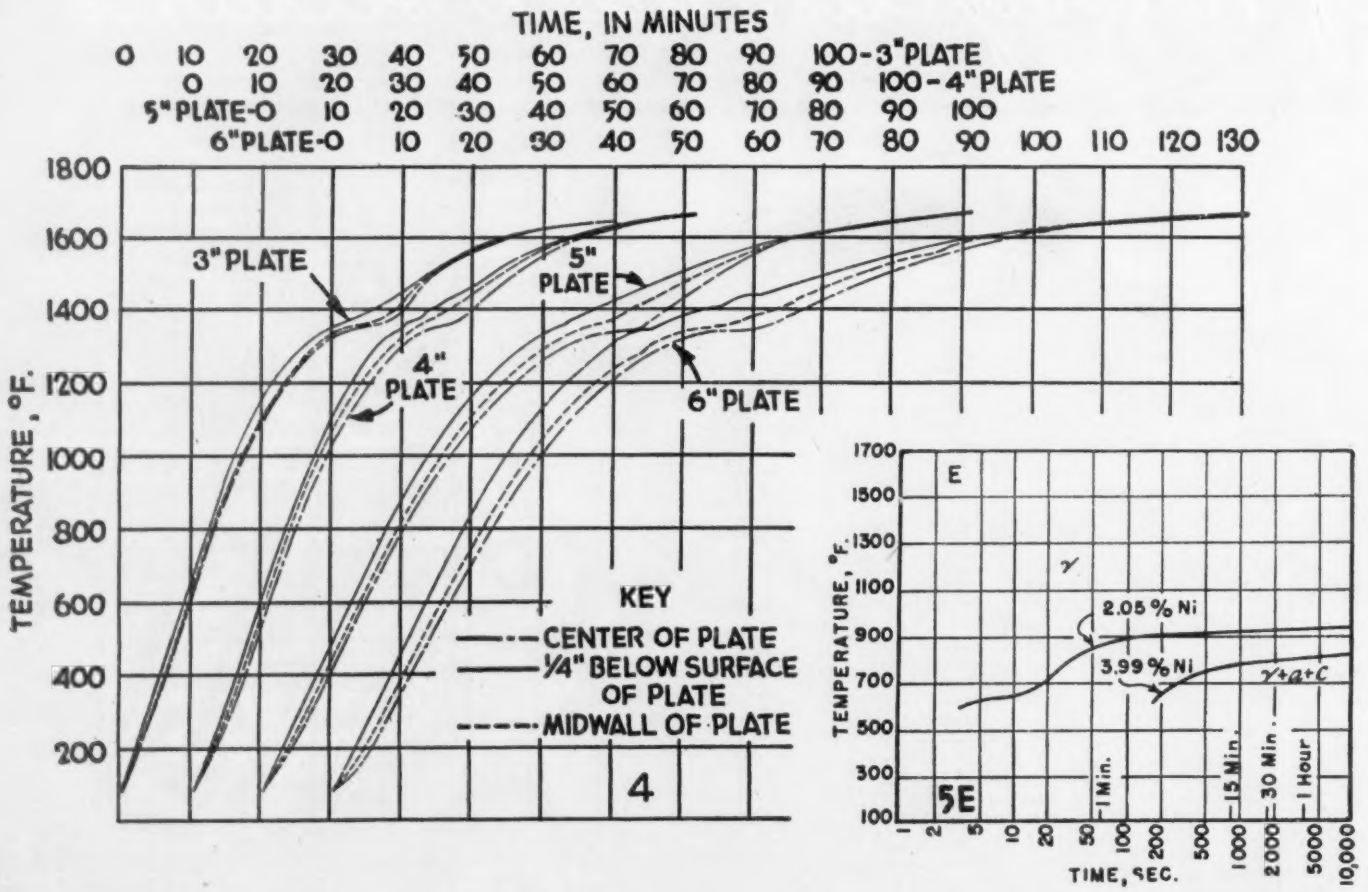
Hardenability Tests: The lowest cooling rate obtainable in the standard end-quench hardenability bar is about 4 F per second at 1300 F. From Fig. 3, it is apparent that the standard end-quench hardenability bar is incapable of producing data that can be directly applied to plate thicknesses greater than about 5 in. In an attempt to overcome the handicap of not being able to measure hardenability as it pertains to these heavy sections, a hardenability specimen was devised to cover the range of cooling rates beyond the limits of the standard end-quench bar. The method of constructing this special hardenability bar is indicated in Fig. 6, and the cooling rates obtained on such a bar are indicated in Fig. 7. Thus, with the lowest cooling in the standard end-quench bar being about 4° per second at 1300 F, the special hardenability bar ranged from about 5° to 1° per second at 1300 F.

The utility of this air-cooled hardenability test was not so great as originally anticipated. When twenty steels of high-alloy content were tested, not one changed more than 2 points rockwell C between the slow-cooled and the fast-cooled end of the test bar, and only one steel exhibited a conspicuous change in microstructure within the length of the bar. It appeared from these results that, if the hardenability of the steel was high enough to give practically a horizontal line after the standard end-quench test, it was also sufficient, for practical purposes, to give complete hardening at cooling rates as low as 1 F. The microstructures of the special air-cooled hardenability bar were examined to locate the approximate position where nonmartensitic transformation products began to form. Such a rating proved to be rather inaccurate because of the difficulty of distinguishing between martensite and low-temperature bainite. It was found that more useful information could be obtained from the isothermal transformation diagrams of the steels.

Isothermal Diagrams: A study of the effect of chromium, manganese, molybdenum, and nickel on the beginning isothermal transformation of several heavily alloyed steels was made. Fig. 5 indicates that the generous use of al-

Fig. 4—Heating curves for 3, 4, 5 and 6-in. plates

Fig. 5E—Chart showing influence of nickel on beginning of isothermal transformation



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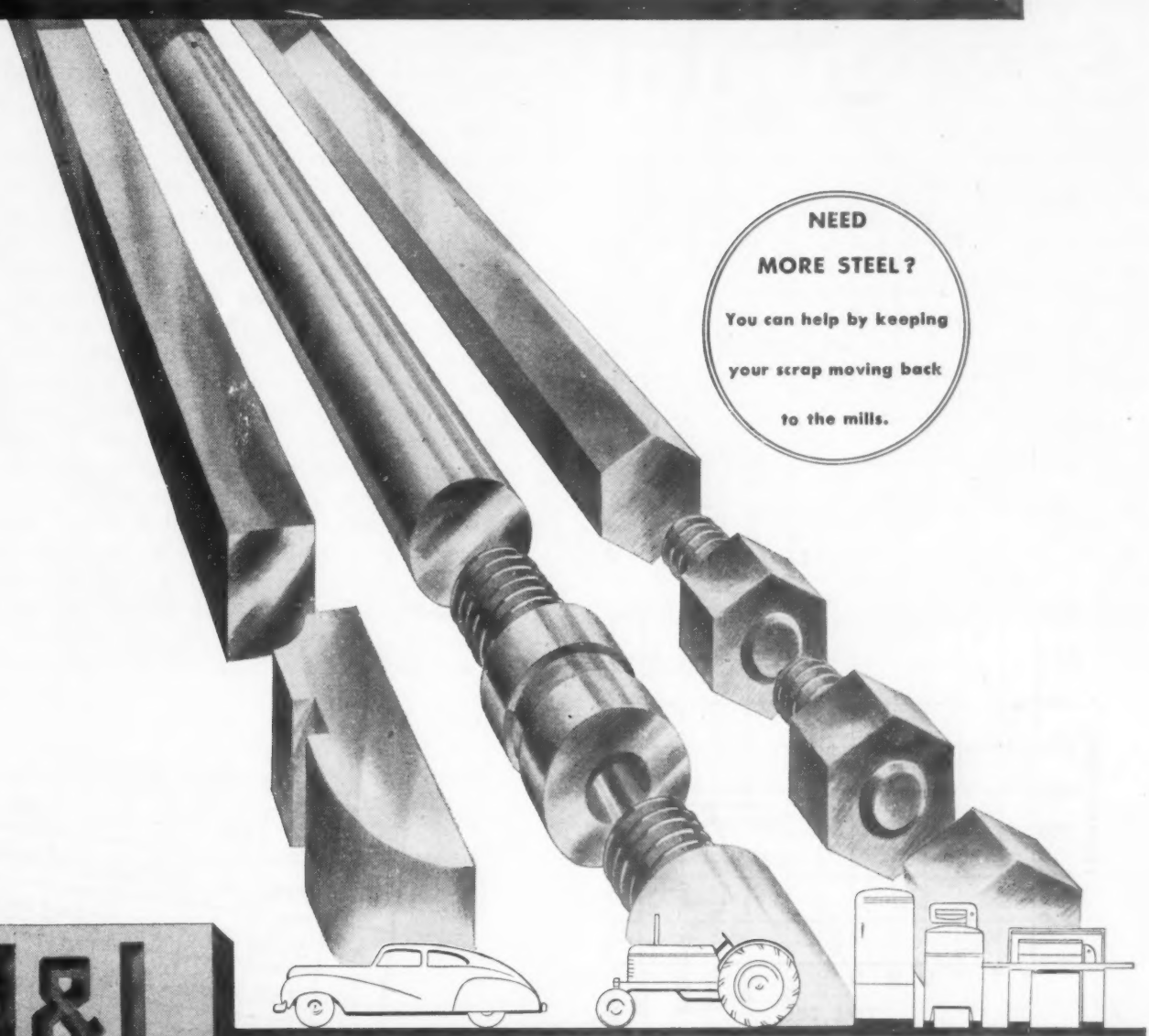

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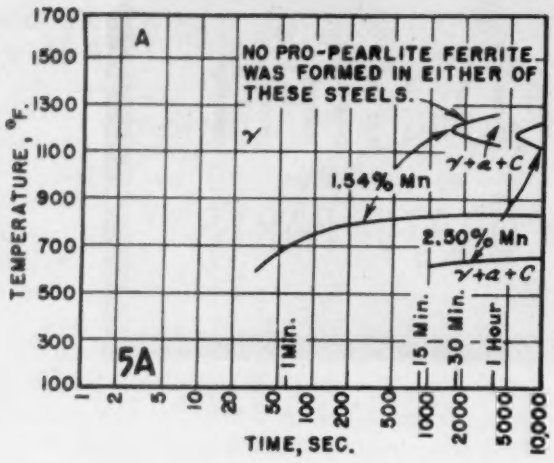
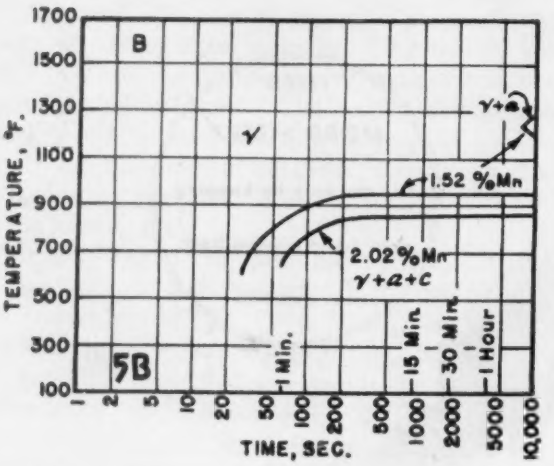




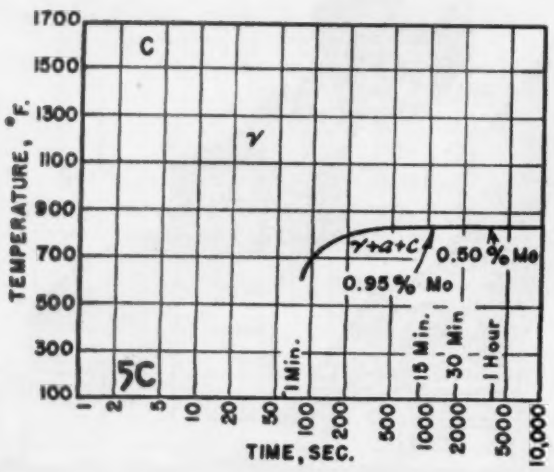


Fig. 5—Charts showing influence of manganese, molybdenum and nickel on the beginning of isothermal transformation in several heavily alloyed steels. They indicate that generous use of alloys leads to ready suppression of transformation within the pearlitic range, but is much less effective in suppressing transformation within the bainitic range

loys leads to a ready suppression of transformation within the pearlitic range, but is much less effective in suppressing transformation within the bainitic range. It is characteristic of alloying elements in general that they affect the pearlitic range of transformation to a greater extent than they affect the bainitic range.

Carbon, on the other hand, affects transformation within the bainitic range to a much greater extent than it affects transformation within the pearlitic range, and the curves shown in Fig. 5 would be greatly changed by increasing the carbon content as much as 0.10 to 0.15 per cent. However, such an increase in carbon content would greatly increase the quench-crack susceptibility of the steel, and for this reason it is generally not feasible to attempt to obtain more complete hardening by use of greater amounts of carbon. Fig. 5 indicates that use of manganese and nickel in increasing amounts does tend to retard beginning bainitic transformation, and that manganese is perhaps three or four times as effective as nickel in this respect on a percentage basis.

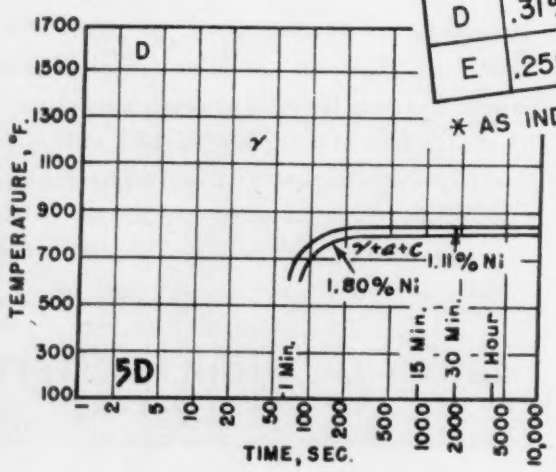
Work by Griffiths, Pfeil, and Allen[2] has indicated that chromium also has an effect on beginning bainitic transformation to an extent that is intermediate between the effect of manganese and the effect of nickel noted previously. The isothermal tests made on the two steels having 0.50 per cent molybdenum and 0.95 per cent molybdenum but of the same base analysis were unique in that increasing the molybdenum content had no apparent effect on the beginning of bainitic transformation.

Factors Limiting Useful Amount of Alloy: From the considerations so far discussed, it would appear that by simply adding generous amounts of alloy, a composition of sufficient hardenability to be suitable for any given section could eventually be reached. However, there are several factors which tend to limit the amount of

ALLOY BASE ANALYSES

Fig.	C	Mn	Ni	Cr	Mo
A	.30%	*	.97%	2.05%	.43%
B	.30%	*	1.11%	.66%	.55%
C	.33%	1.49%	2.07%	.67%	*
D	.31%	2.02%	*	.66%	.55%
E	.25%	1.49%	*	.69%	.54%

* AS INDICATED ON THE DIAGRAM



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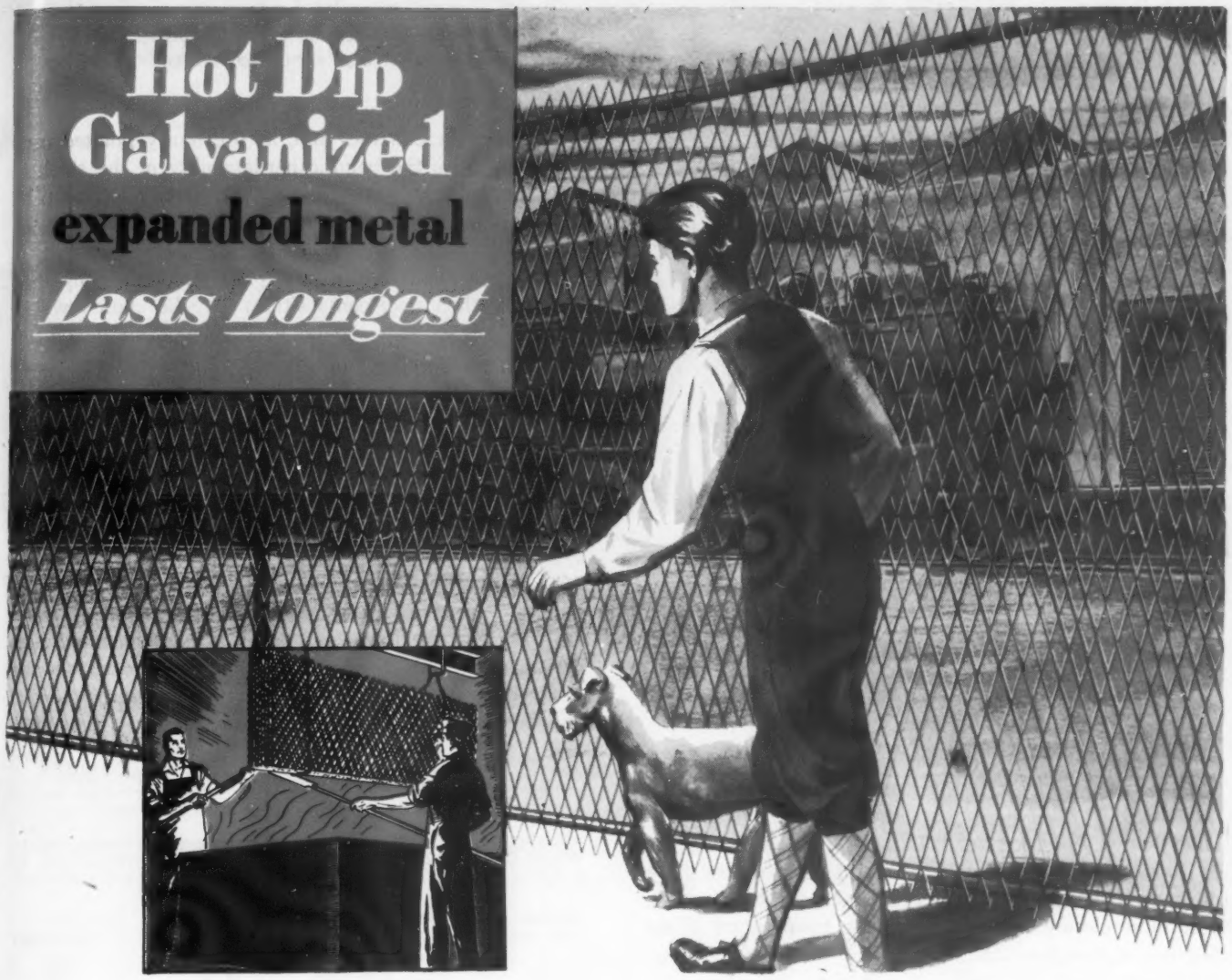

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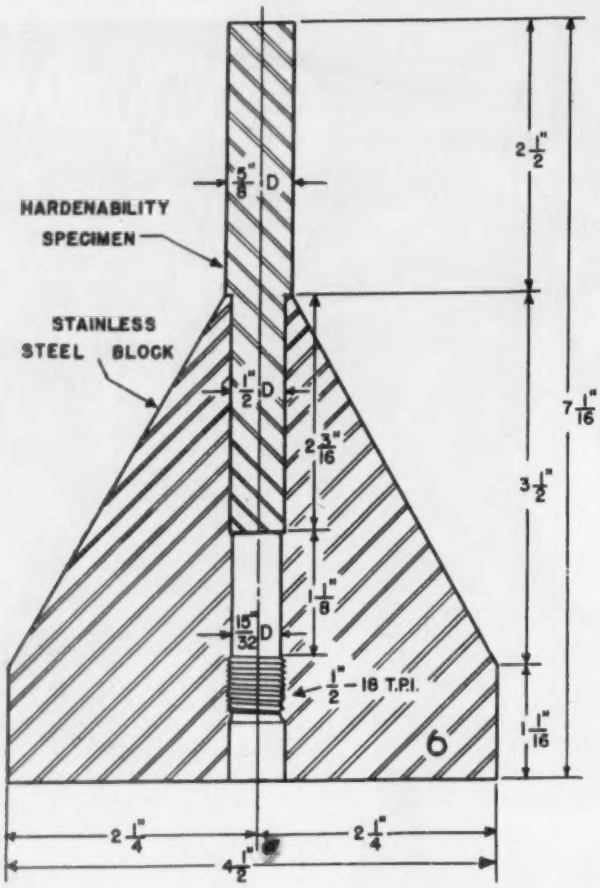


Fig. 6—Special air-cooled hardenability specimen and block designed to cover the range of cooling rates beyond the 5-in. thickness limit of standard end-quench bar

alloy that may be used to advantage. First, as the amount of alloy is increased, the tendency of the steel to crack during quenching is increased. Quench cracking is probably more closely associated with the temperature of the martensitic transformation range than it is with any other characteristic of the steel. The higher the martensitic transformation temperature, the less is the quench-cracking susceptibility, and the lower the martensitic transformation temperature, the greater is the quench-cracking susceptibility.

Carbon has a far more powerful effect in lowering the martensitic transformation range than any other element; hence, it is desirable to keep the carbon content of the steel as low as practical. Other common alloying elements also tend to lower the martensitic transformation range, but to a much lesser extent than carbon. Castings which contain drastic changes in section thickness are, of course, more susceptible to quench cracking than those of more uniform thickness. Thus, the shape of the casting imposes certain limits on the amount of alloy which can be used without encountering a prohibitive amount of cracking when the part is quenched.

Second, as the amount of alloy is raised, the susceptibility of the steel to temper brittleness is, in general, increased. Molybdenum is an exception to this general rule and, in fact, molybdenum may be used as a partial remedy for temper brittleness. Little advantage is to be obtained from the use of molybdenum in amounts greater than 0.5 per cent, since amounts of more than this seem to have little additional effect on the temper-

Fig. 7—Cooling rates obtained on the special hardenability bar

brittleness characteristics and, as previously pointed out, do not increase the bainitic hardenability of the steel.

Table I indicates that, if the final hardness of the part is to be sufficiently low that tempering temperatures of about 1150 F or higher may be used, and if it is possible to water quench the part after the tempering operation, then steel compositions may be chosen which will produce castings at least 9 in. in thickness which are not temper embrittled. However, if the final hardness must be such that tempering temperatures within the range of 900 to about 1100 F are essential or if it is impossible to water quench after the tempering operation, then it is inevitable that such highly alloyed steel will show a considerable degree of temper embrittlement.

Third, use of large amounts of alloy leads to increased difficulty in obtaining hardnesses and structures that are readily machinable. Many large steel castings must undergo considerable amounts of machining prior to being placed in service. It is usually desirable, sometimes even essential, to develop a brinell hardness within the range of 180 to 250 for the machining operation. Use of large amounts of alloy (*Please turn to Page* 111)

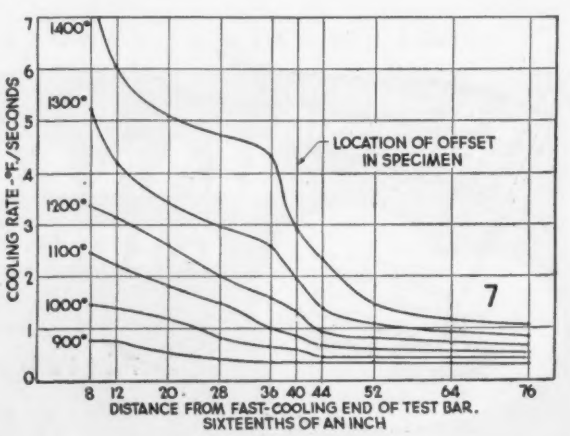
TABLE 1

V-NOTCHED CHARPY VALUES FOR HEAVILY ALLOYED STEELS WHEN COOLED FROM THE AUSTENITIZING TEMPERATURE AT A RATE EQUIVALENT TO THAT IN THE CENTER OF A WATER-QUENCHED 9-IN. PLATE

Analysis, Per Cent	Heat 10997	Heat 10998	Heat 10999
C	0.27	0.28	0.29
Mn	1.50	2.14	1.28
Si	0.36	0.42	0.37
Ni	2.09	...	1.66
Cr	0.75	0.65	1.45
Mo	0.49	0.49	0.50
P	0.027	0.038	0.036
S	0.021	0.024	0.020

V-Notch Charpy Values* Cooling rate after tempering.	Room Temp., Ft-lbs.	—40 F Ft-lbs.	Room Temp., Ft-lbs.	—40 F Ft-lbs.	Room Temp., Ft-lbs.	—40 F Ft-lbs.
0.026 F/sec. at 900 F	66.0	44.0	65.0	29.5	59.5	25.5
1.16 F/sec. at 1000 F**	66.0	57.0	67.5	49.0	59.0	51.5

*Average of four tests.
**Equivalent to center cooling in water-quenched, 9-in. plate.



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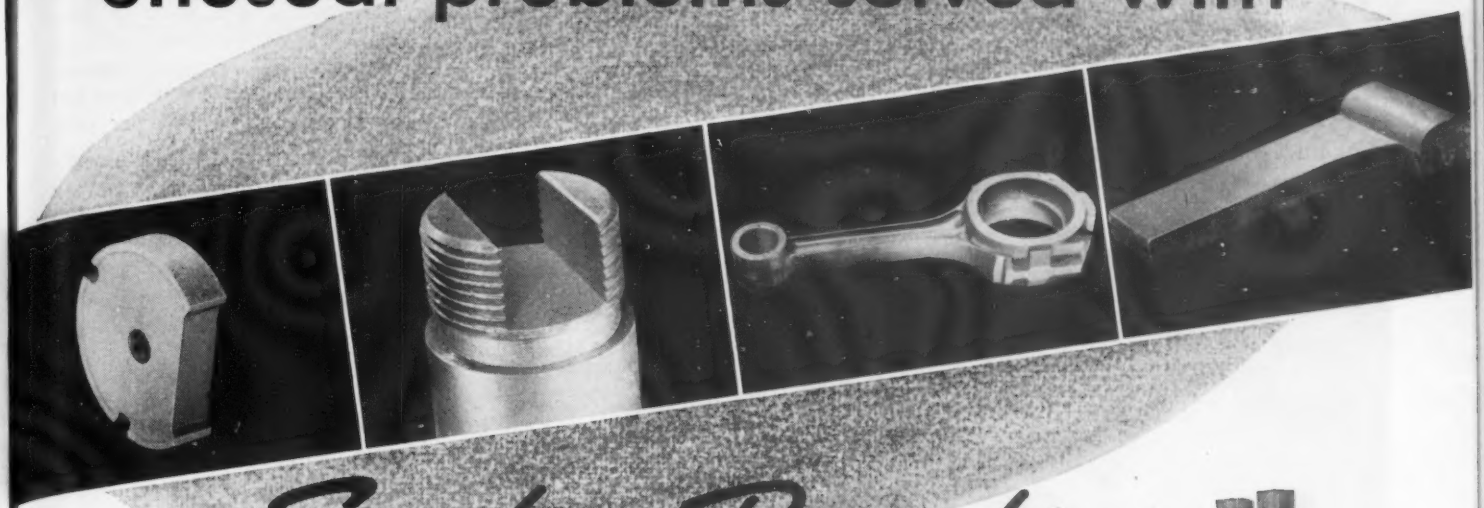
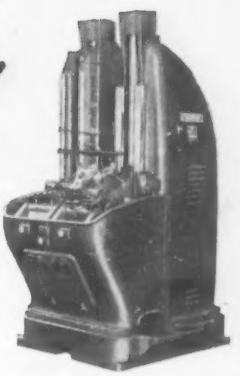


Surface Broaching



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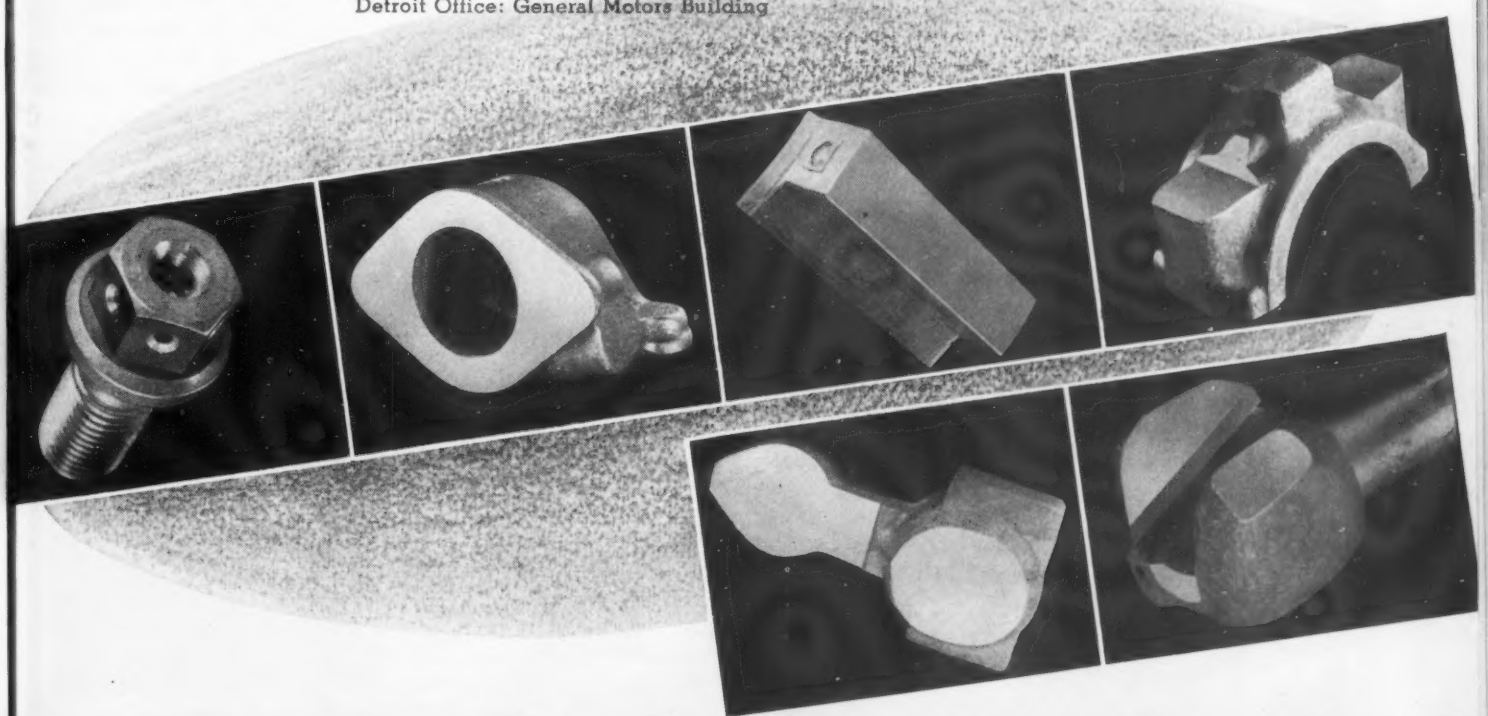

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Induction Soldering

. . . increases radiator assembly production 280 per cent

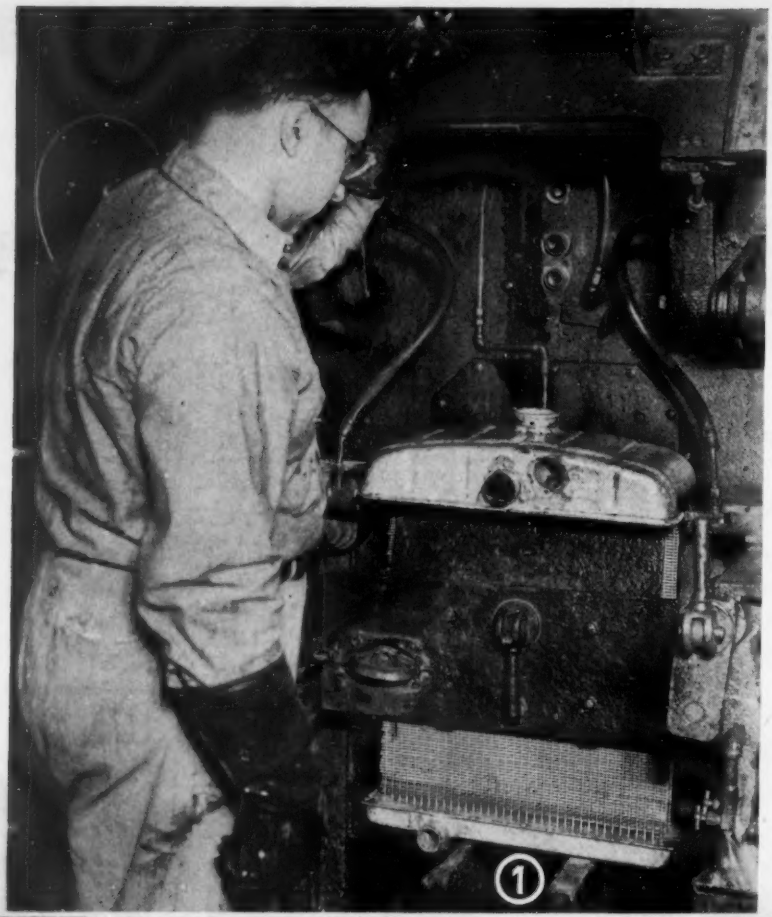
SUBSTANTIAL reductions in unit costs and important production increases have been realized in many plants through use of induction heating and soldering. One of the plants in this category is the tractor division of International Harvester Co. of Chicago, which increased its output of soft soldering radiator assemblies by 280 per cent.

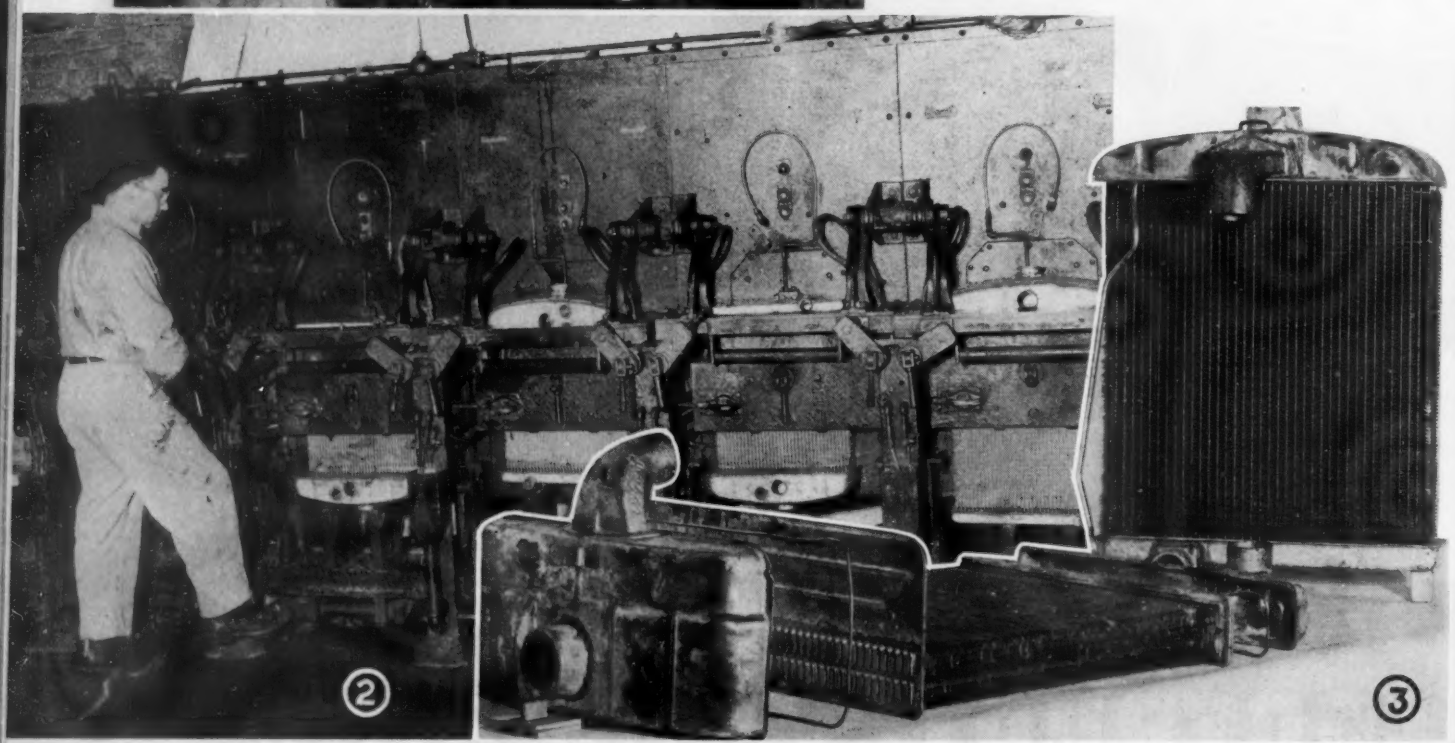
Effective use of induction soldering enables the plant to turn out 28 radiator assemblies per hour compared to the old production rate of 10 per hour, using hand methods. In addition, the company is saving $7000 in solder costs annually due to a prefabricated solder ring employed in the operations. The ring contains the exact amount of solder required in each operation.

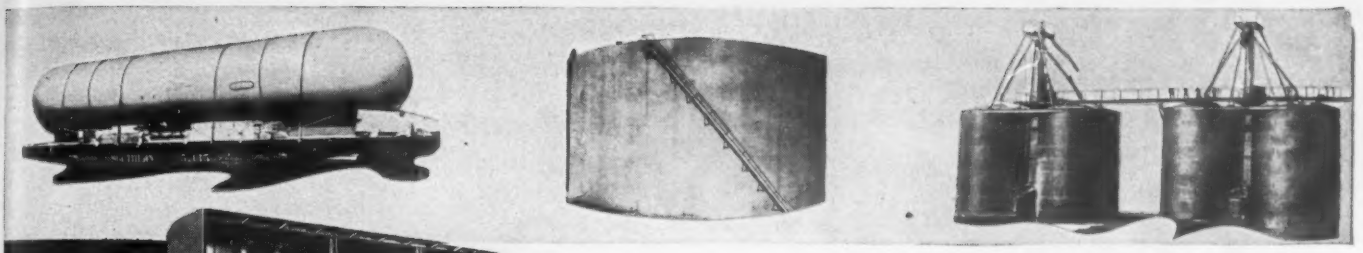
Path to this production increase began late in 1944 when International Harvester installed a 9600 cycle 20 kw Tocco induction heating unit in the tractor plant for soft soldering the assemblies. But lack of additional floor space for increased production requirements made it necessary to find a more efficient method of soldering. This led International to engineer a 6-station work unit that could be coupled to the 20 kw induction heating machine supplied by Ohio Crankshaft Co., Cleveland. Assembled unit shown in Fig. 2 consists of both heating unit and 6-station assembly.

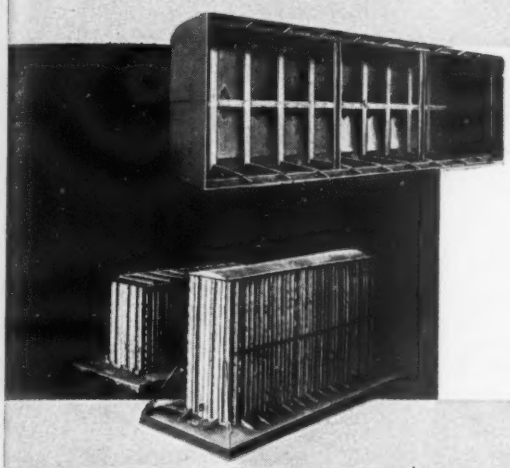
The 6-station unit is set up for three types of radiators. Two of the units are used for each type of radiator, one to solder the top tank assembly and one to solder the bottom assembly. Radiator prior to assembly is shown in Fig. 3, with completed model in background.

In the operation, attendant places a preformed solder ring on the top tank unit, fluxes the joint, inserts the radiator in the fixture and pulls down the hinged inductor coil, Fig. 1, which is of split type. Pushing the control button starts the heating cycle which is automatically timed for completion in 30 sec. Radiator is then removed, inverted, placed in the adjacent station and the procedure repeated on the bottom tank assembly.









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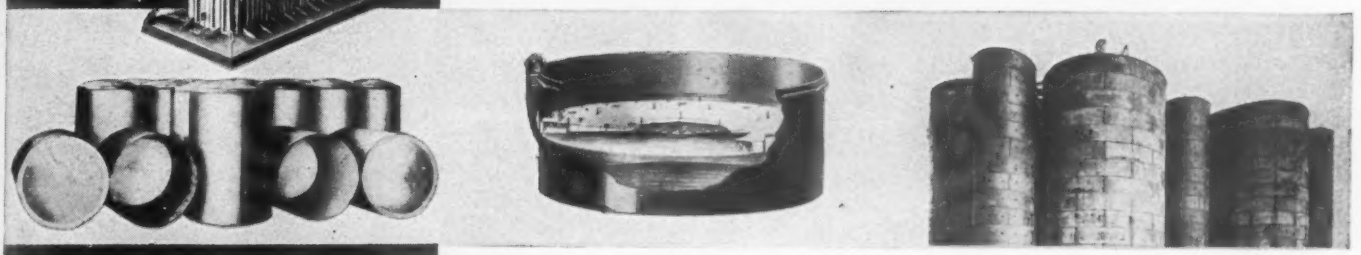

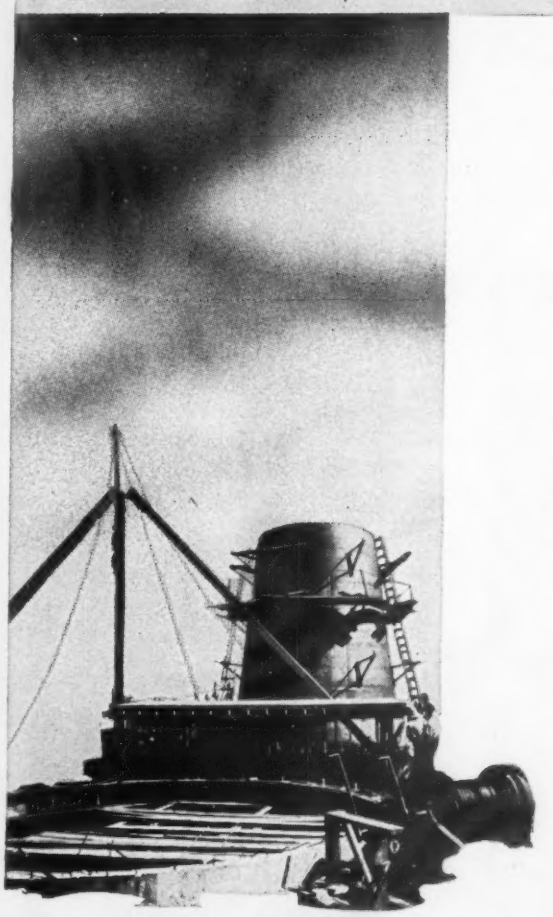

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TRANSPORTING *Quenching Tanks*

Use of power trucks speeds up production, evens flow of materials and helps to synchronize operations. "Home-made" truck attachments assist in handling operations

HEAT treating operations are seeing increased power truck use because of their ability to handle large loads of metals, hot or cold, with speed and safety, utilizing "home made" equipment designed by plants to solve their own particular problems.

After installing a battery of four heat treating furnaces, a company manufacturing iron and steel valves had difficulty in synchronizing their work with machining and assembling operations. A substantial portion of the shells and other parts of the valves are heat treated. The department has a daily capacity for finishing of 40 to 50 tons of commercial iron and steel castings and accessories and assembling them into complete valves.

Purchase of two low-lift platform trucks manufactured by Elwell-Parker Electric Co., Cleveland, provided a continuous flow of parts to and from the heat treating equipment. Parts to be heat treated are moved to the furnaces in skid boxes and, when heated to the right temperature, are quenched in oil by being raked directly into tanks placed close to the furnace on the truck platform. These tanks, shown in Fig. 1, have cross bars welded to the underframe at the height of the truck's platform, providing a means of lifting the tank and its contents, both of which together weigh more than a ton.

The load is picked up by the truck and moved to an open area for cooling after the castings are quenched. Another tank with oil is brought into place to repeat the operation. Tanks have hinged covers which are closed while they are being transported.

Another company, a bearing and bushing manufacturer, consumes, in addition to bronze and other metals, a large tonnage of strip steel, which is unwound, passed through a copper-lead composition and rewound. Coils are piled on skids in loads of 12,000 to 15,000 lb and transported to annealing ovens on power trucks. The skids remain with the steel in the oven which are heated to a temperature of 425° F.

When it was found that ordinary types of skids buckled, the company devised the skid shown in Fig. 2, consisting of two lengths of channel steel forming runners. Along the top ledge of each runner is welded a corresponding length of square steel tubing, the same size that is used to connect by welding the runners at six points. The top of the platform is an open framework, the air space retarding heat absorption.

A similar difficulty was overcome by some manufacturers of forgings by using skid boxes provided with double bottoms. Boxes were built with short lengths of boiler tubes placed side by side to form a heat-dispersing bottom.

Bearing shells are stacked in ordinary

(*Please turn to Page* 138)

Fig. 1 (above) — Fabrication of quenching tanks for use with industrial power trucks, such as shown here, enabled one company to provide a continuous flow of parts from its heat treating department. Parts are raked from furnaces into tanks, moved to a cool location by trucks

Fig. 2 (below) — "Home made" skids manufactured to transport 12,000 to 15,000 lb coils of steel to an annealing oven. Skids are moved into oven and left with steel

A total of 85 Meehanite Castings are built into this Farrel 60" by 24" heavy-duty roll grinder shown grinding a 59" diameter by 130" face steel backing-up roll weighing 63 tons.

MEEHANITE CASTINGS Provide *Built in* DEPENDABILITY to Farrel Roll Grinders

This partial list of Meehanite Castings used in the construction of heavy-duty roll grinders built by Farrel-Birmingham Company, Inc., Ansonia, Conn., is proof in itself of the confidence designers and builders of industrial equipment place in the *better* engineering properties provided by Meehanite.

1. Front Bed
2. Back Bed
3. Ways
4. Carriage
5. Wheelhead
6. Headstock Base
7. Footstock
8. Neck Rests
9. V-Belt Pulleys
10. Headstock Spindle
11. Footstock Spindle

Meehanite Castings offer important characteristics which contribute to the performance and quality of the finished unit and efficient manufacture. Vibration dampening in equipment of this type contributes to higher precision and better quality surface finish. Way surfaces maintain their accuracy for many years with scarcely discernible wear.

Finally from the standpoint of the manufacturer, Meehanite's ready machinability is also an important factor in production.

Write for the Meehanite Handbook which contains 59 pages of engineering data about Meehanite Castings.

See the Meehanite movie at Booth E-153 at the Metal Show.

New 16 mm motion picture "Meehanite Means Better Castings" just released. We will be glad to lend you a print.

MEEHANITE

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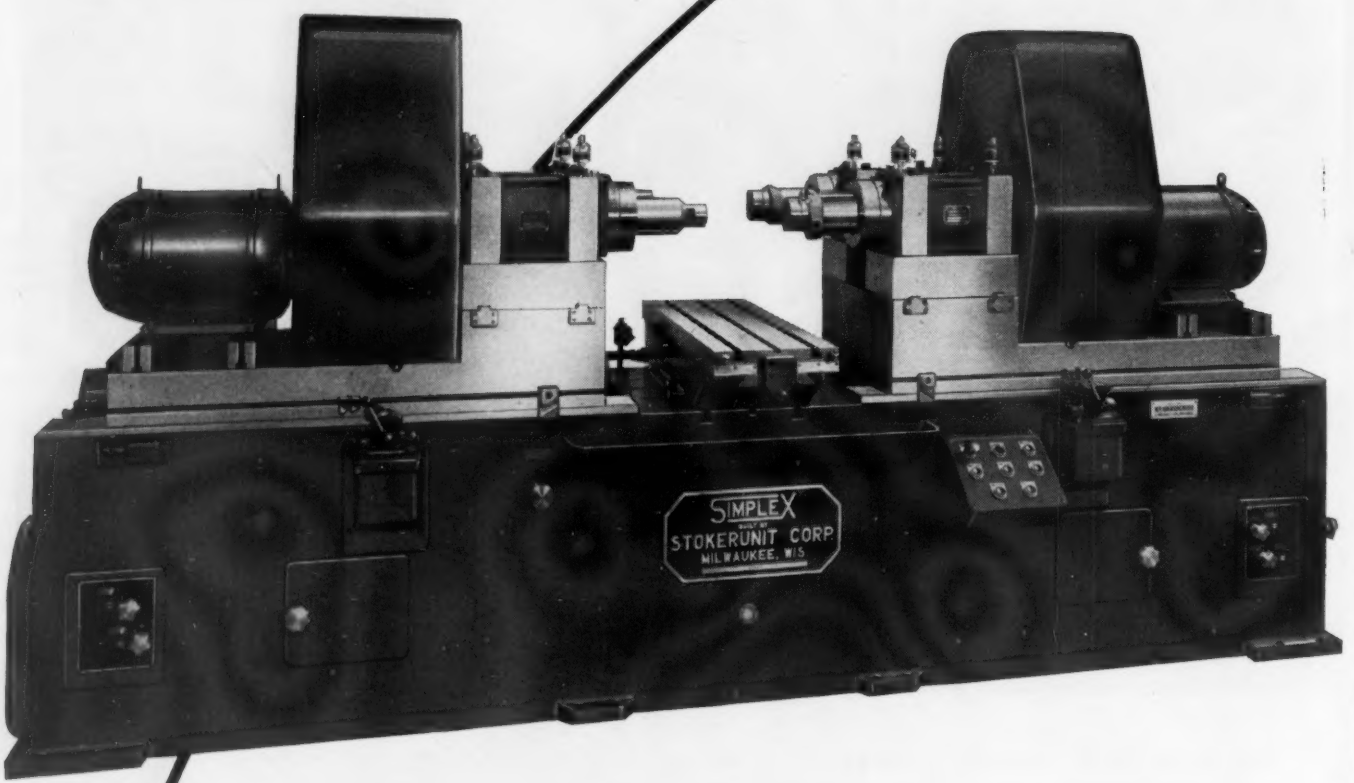
METAL

SIMPLEX

Increasing wage rates of today make necessary new methods of reducing costs. At medium production rates, this becomes difficult with general purpose machine tools. Simple multiple tooling and fixtures, indexing from roughing to finishing position, offer a new cost reduction method. Tooling costs are low — job possibilities endless.



This photograph shows a SIMPLEX 4U 2-way Precision Boring Machine equipped with four #4 spindles and a hydraulically indexed sliding table operating between adjustable positive stops. On the sliding base a single work holding fixture is mounted providing for operating on the work from both ends. After the roughing operation is completed on both ends, the table is indexed to the finishing position, the finishing operations are performed on both ends simultaneously and the completed job is ready to remove from the fixture to change to the next job. The fixture and tools are removed and retained intact, ready for a quick set-up when the job is again run. The automatic cycle relieves the operator and helps maintain predetermined production schedules.

Precision Boring Machines

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Precision Boring Machines, Planer Type Milling Machines and Special Machine Tools

Carburizing furnace showing tray of parts being pushed into heating zone.

Carburizing Treatments

. . . use atmosphere composed of cracked gas, natural gas and ammonia on small parts

THREE carburizing procedures, two of which combine a hardening treatment, are performed at the National Cash Register Co. in a Ni-Carb furnace using atmosphere developed by the company's Dayton, O., metallurgical laboratory. The atmosphere also furnishes nitrogen to produce superimposed nitriding on the carburized surface.

The atmosphere is produced by taking natural gas and air in the proportion of one part of natural gas to five-and-one-half parts of air and burning it in a retort. The product of this combustion is then fed into another retort and cracked by electrically generated heat at 1800° F. This second retort is filled with refractory-catalytic brick. Formerly charcoal was used but the use of refractory brick eliminates the need for recharging the retort at frequent intervals since the brick is good for a long time.

Gas resulting from this cracking process is then drawn off and mixed with natural gas and ammonia in the proportion of 400 cu ft per hour of cracked gas to 250 cu ft per hour of natural gas and 250 cu ft per hour of ammonia. Furnace, shown above, in which this mixture is used can stand 0.90-in. water pressure. In case the resulting atmosphere has a greater water pressure per inch than this, it can be reduced by cutting the proportion of cracked gas in the mixture.

For combination carburizing and hardening treatment the parts to be treated are put in a tray and the tray is pushed into the heating zone of the furnace. Temperature ranges from 1500 to 1600° F, depending upon depth of case desired. Parts remain in the heating zone from 1½ to 3½-hours. Tray is then pushed into the cooling zone filled with the same atmosphere kept in constant state of agitation by means of fans to induce faster cooling. It takes about an hour in this cooling zone to give the parts an air quench.

For carburizing and hardening by an oil quench the same procedure is followed up to the quenching operation. Heating zone is filled with an atmosphere slightly different than that used in the process just described. This atmosphere is made in the same way and with the same proportions except in the final stage where the gas resulting from the cracking is mixed with natural gas and ammonia. The proportions of these three component parts is different. Two hundred cubic feet per hour of natural gas and 100 cu ft per hour of ammonia are added to 200 cu ft per hour of natural gas. The tray is allowed to remain in the heating zone for the same length of time as in the preceding process.

In the air quench process the tray with the parts passes over an elevator in moving from the heating zone to the cooling zone. In the oil quenching process, tray stops on elevator and is lowered into a tank of quenching oil located next to the heating zone. The tray remains in quench for 5 min after which the parts are finished. There is an interval of not more than 5 sec from time the tray leaves the heating zone until it is plunged into the quenching tank.

Any surfaces that are not to be carburized are copper plated to keep them from being hardened in the process. This cuts down distortion in the parts and keeps them soft for later machining. It also prevents parts from becoming too brittle.

A third variation of this process is one that carburizes only, without hardening. Process, used largely for parts that will be copper brazed later, is identical with the oil quenching procedure except that parts move from the heating zone into the cooling zone and are left here for about an hour, the time varying according to the parts being carburized.

New Drive To Be Featured at Exposition

Along with the Electrofluid drive—a new approach to the application of power to machinery of all types—Link-Belt Co. of Chicago and Philadelphia, will exhibit its new line of ball and roller bearings at the 17th National Exposition of Power and Mechanical Engineering in New York City's Grand Central Palace, December 2 to 7.

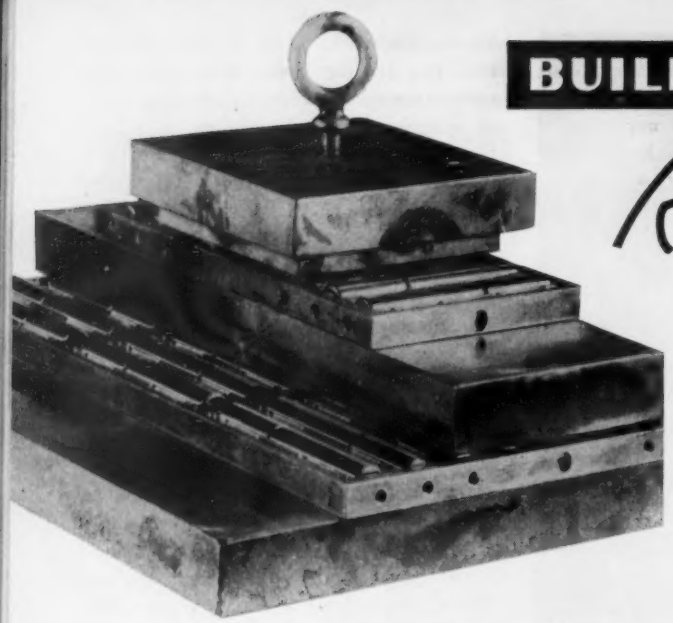
Also to be shown is a photographic presentation of the company's power transmission machinery, used in conjunction with its line of conveying and elevating equipment.

Welding Practices Book

A compilation of practices for spot and seam welding of low-carbon, stainless and hardenable steels, nickel, Monel and Inconel is now available in a 47-page publication of the American Welding Society, "Recommended Practices for Resistance Welding." Projection welding of low-carbon and stainless steels, flash-butt welding low and medium forging strength steels and standard methods for testing are also covered in detail.

Each recommended practice comprises a table of machine settings for current, voltage, time, pressure and other factors which will produce welds of specified strength in various thicknesses of materials. The section on standard methods for testing resistance welds covers tests for tensile strength, shear strength, impact strength, fatigue properties and hardness, as well as a complete description of the test specimens, the equipment to be used, and the procedure to be followed.

Copies may be obtained from the American Welding Society, 33 W. 39th street, New York, at 50 cents per copy.



BUILDING ON Roller Bearing Foundations

Installation of 65 alloy steel roller bearing assemblies enables engineers to add three floors to a six-story building—meeting Los Angeles antiearthquake construction regulations

Fig. 1—Closeup of roller bearing assembly. Acme photo

SPECIALLY designed alloy steel roller bearings, each weighing 600 lb and capable of carrying 250,000 lb are being used to permit the addition of three floors to a six story building in Los Angeles. Said to be the first such installation, the application of bearings will enable the building to "roll with the punch" of an earthquake.

As a novel solution to a difficult engineering problem on the Sears Roebuck & Co. plant, built in 1929, use of bearings will enable engineers to meet the present building regulations. The code requires that all construction be designed to withstand the horizontal stress caused by seismic disturbances.

The 1929 building will carry only the vertical load of the three-story addition, while an adjoining structure with an 8-in. separation, built in 1940 and conforming to the code, will absorb both the earthquake rockings of its own mass and any shocks suffered by the addition. Sixty-five roller bearing assemblies, each 21 in. square, placed between the 1929 building and its new floors will carry the vertical load, and at the same time absorb any horizontal stress. In addition, each of the new floors will be tied rigidly to the adjoining 1940 building.

The bearings, made by The Torrington Co., South Bend, Ind., consist of three steel plates with two interposed sets of steel rollers placed at right angles to each other. The rollers between the bottom and center plate roll in a north-south direction, while those above move east-west. If a diagonal shock is encountered, both sets of rollers operate. Acting together, they allow the top three floors to move 6 in. in any direction.

Thus the structure may move anywhere within a circle 12 in. in diameter. Calculations for horizontal force were based on the Los Angeles building code seismic factor of 0.13 g maximum, with which the relative movement of the 1929 building and its new addition were figured to be about 5½-in.

Because of the weight they carry, rollers and steel plates upon which they move are made of alloy steel, ground and polished to mirror-like smoothness, and dimensions held to within millionths of an inch. Each nest of rollers is hermetically sealed so no foreign matter can penetrate, and filled with a lubricant which, it is claimed, has been found by test to show no deterioration in a period of 27 years. To facilitate erection, bearing assemblies come to the job held by bolted clamps to prevent movement until erection is completed.

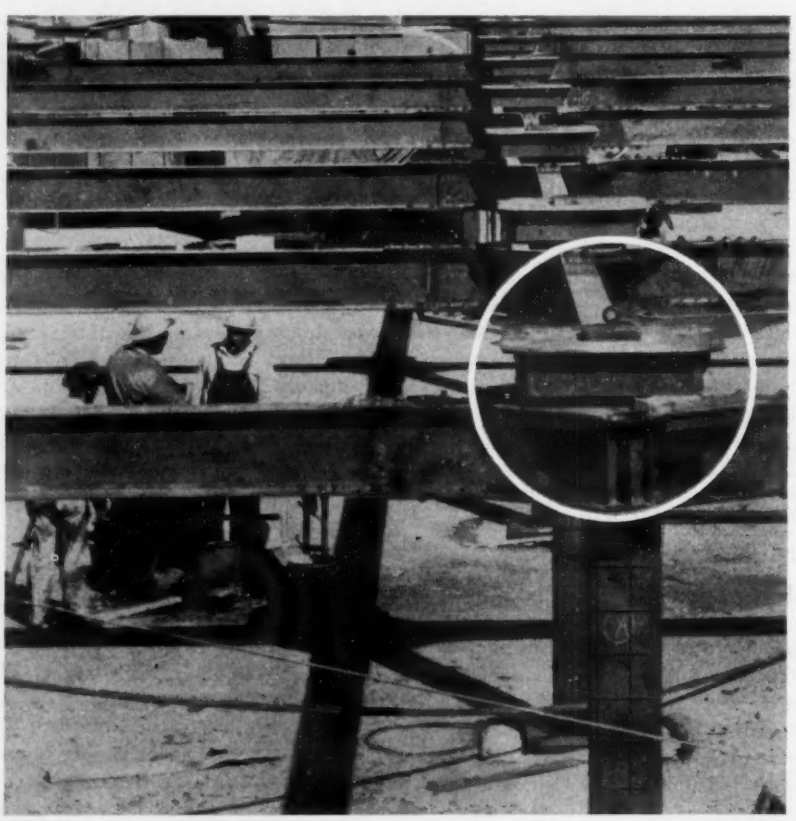
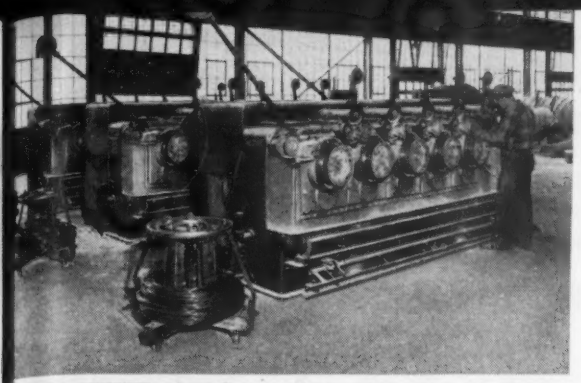
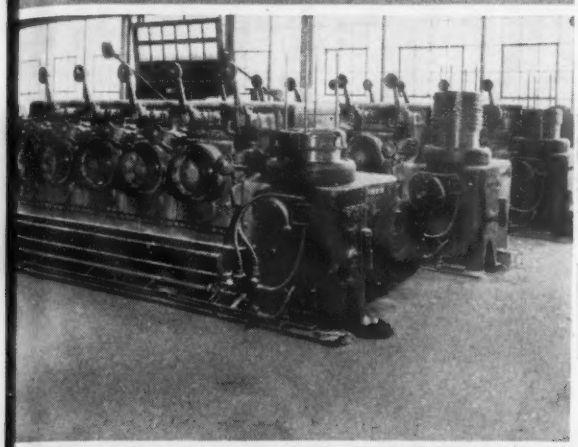


Fig. 2—Earthquake roller bearing, shown in circle, is one of 65 sets each weighing 600 lb and capable of carrying a 250,000-lb load to provide rolling foundation for building addition





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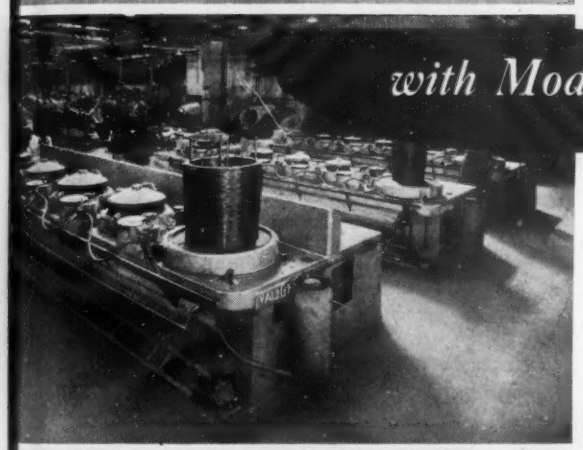

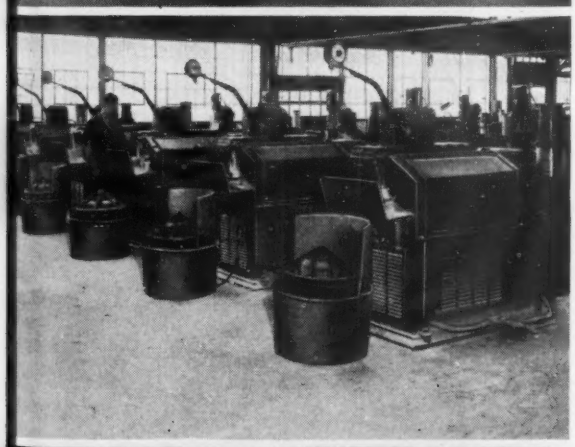

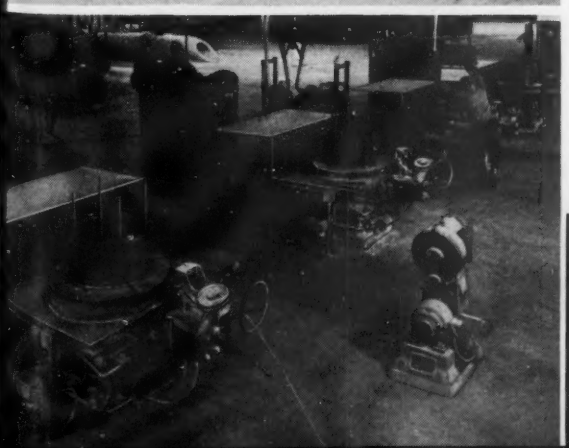

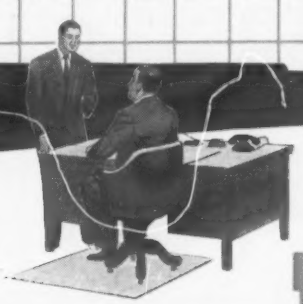

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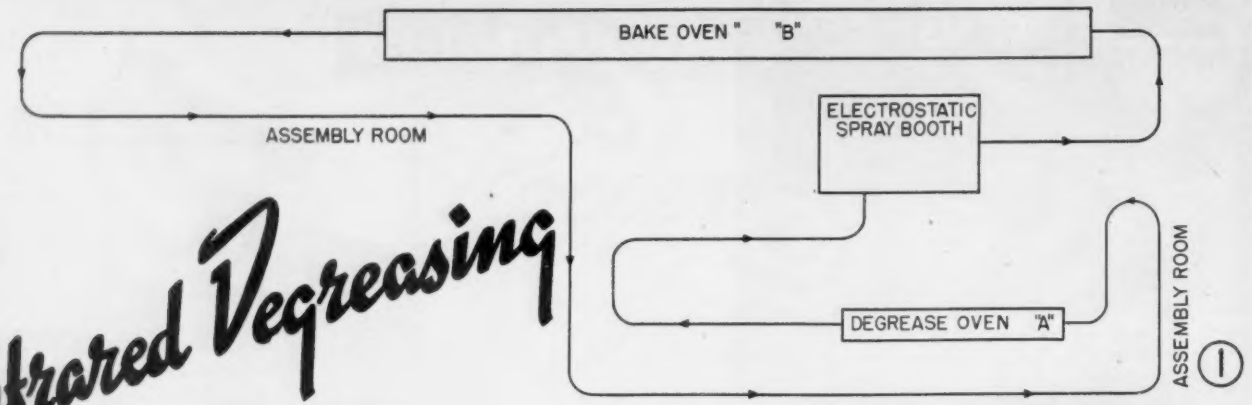

Infrared Degreasing

Production line installation uses 17-ft furnace with 832 lamps to burn grease from metal chair frames in 2½-min.

DEGREASING metal products by infrared light is finding production line application in the manufacture of tubular frames for adjustable chairs at the Buffalo plant of Barcalo Mfg. Co. In addition to the degreasing oven, the plant employs a second furnace for baking the finish.

As illustrated in Fig. 2, frames are carried by overhead conveyor through the 17-ft degrease oven, A on flow sketch, Fig. 1. The infrared energy in this furnace raises the temperature of the metal frames sufficiently to burn the grease deposit off in 2½-min. No flame is present, but grease is merely converted to carbon and goes up in smoke.

Conventional degreasing methods were impossible at Barcalo because the tubular metal frames would have filled with the liquid chemical and so require draining before further finishing could be performed. The infrared degreasing arrangement is said to save the time of at least two men. Also, continuous production line technique and elimination of wiping after the product comes out of the degreasing bath help to cut down manhours.

Frames reach a relatively high temperature during the degreasing, and consequently require a 64-ft travel to cool down after emerging from furnace A. They enter the electrostatic spray booth with a metal temperature of 145° F. That temperature causes excellent adhesion of the white synthetic enamel to the frames, as shown in Fig. 3. Electrostatic spraying is faster than the manual method and is said to conserve paint.

After spraying, frames are conveyed 28 ft to the 51-ft infrared oven, B, where the finish is baked in 8½-min. Frames are allowed to cool down for 15 min. after which the wooden arms, other metal parts and cushions are fitted, and the finished chairs are ready to ship.

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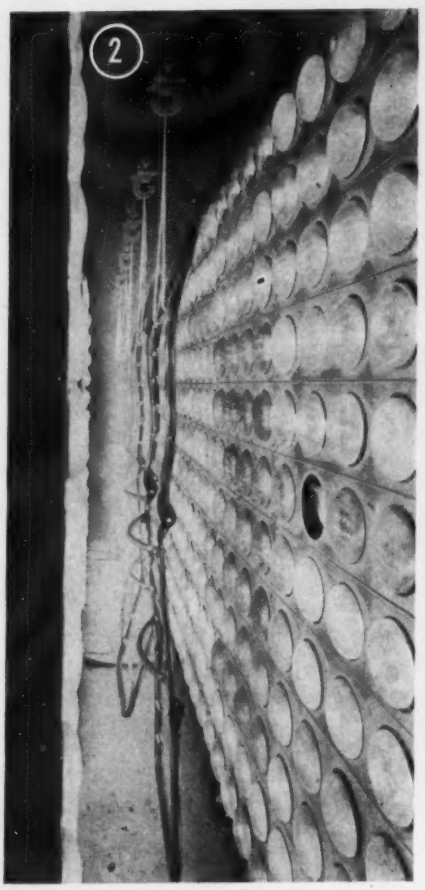


Fig. 1—Sketch of processing layout showing relative positions of degrease furnace, spray booth and bake oven

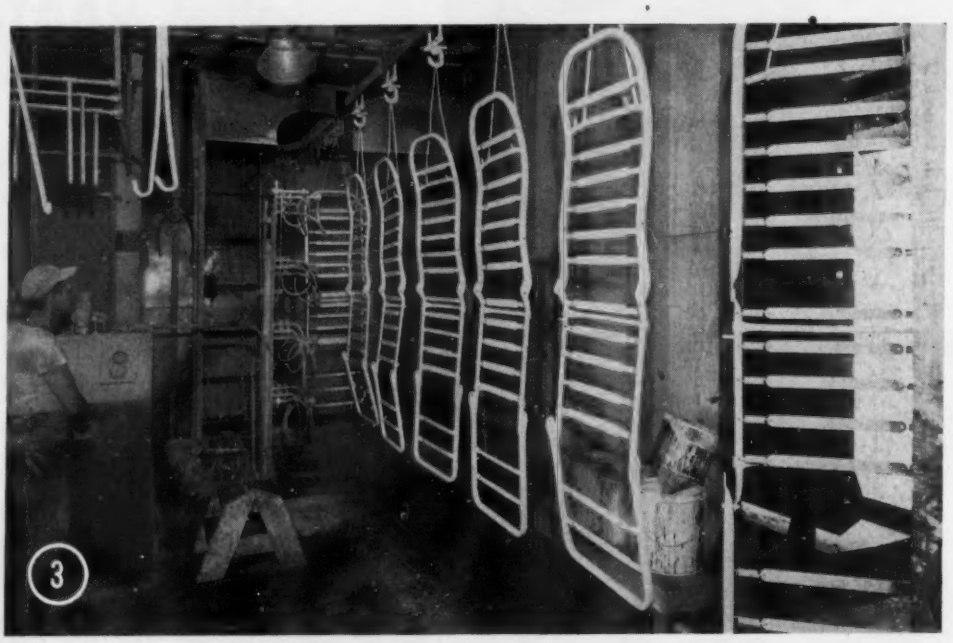
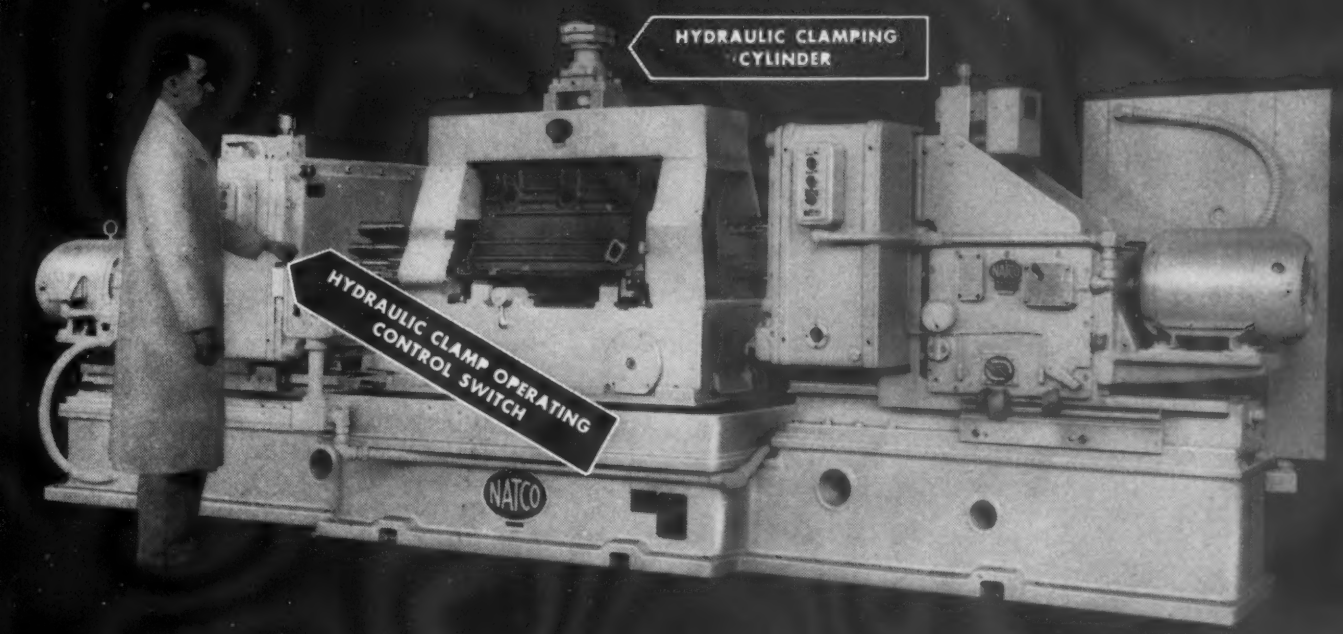


Fig. 2—Frames are carried by overhead conveyor through degreasing furnace in 2½-min. Infrared energy raises metal temperature sufficiently to convert grease to carbon

Fig. 3—Synthetic enamel electrostatically sprayed on frames is baked in 8½-min. in 51-ft oven, far right

NATCO Automatic Clamping Eliminates Wrenches

MORE PRODUCTION LESS FATIGUE



A flip of the switch on any NATCO machine arranged for Automatic Clamping eliminates all of the drawbacks of the obsolete hand-wrench systems. Does away with operator fatigue or variance due to human failure. Speeds production through uniformity of clamping, eliminates spoilage. Results in more parts per hour.

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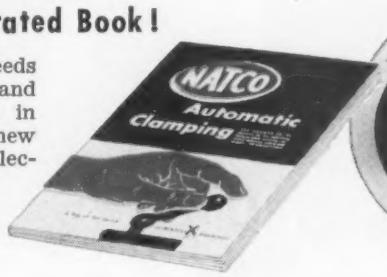

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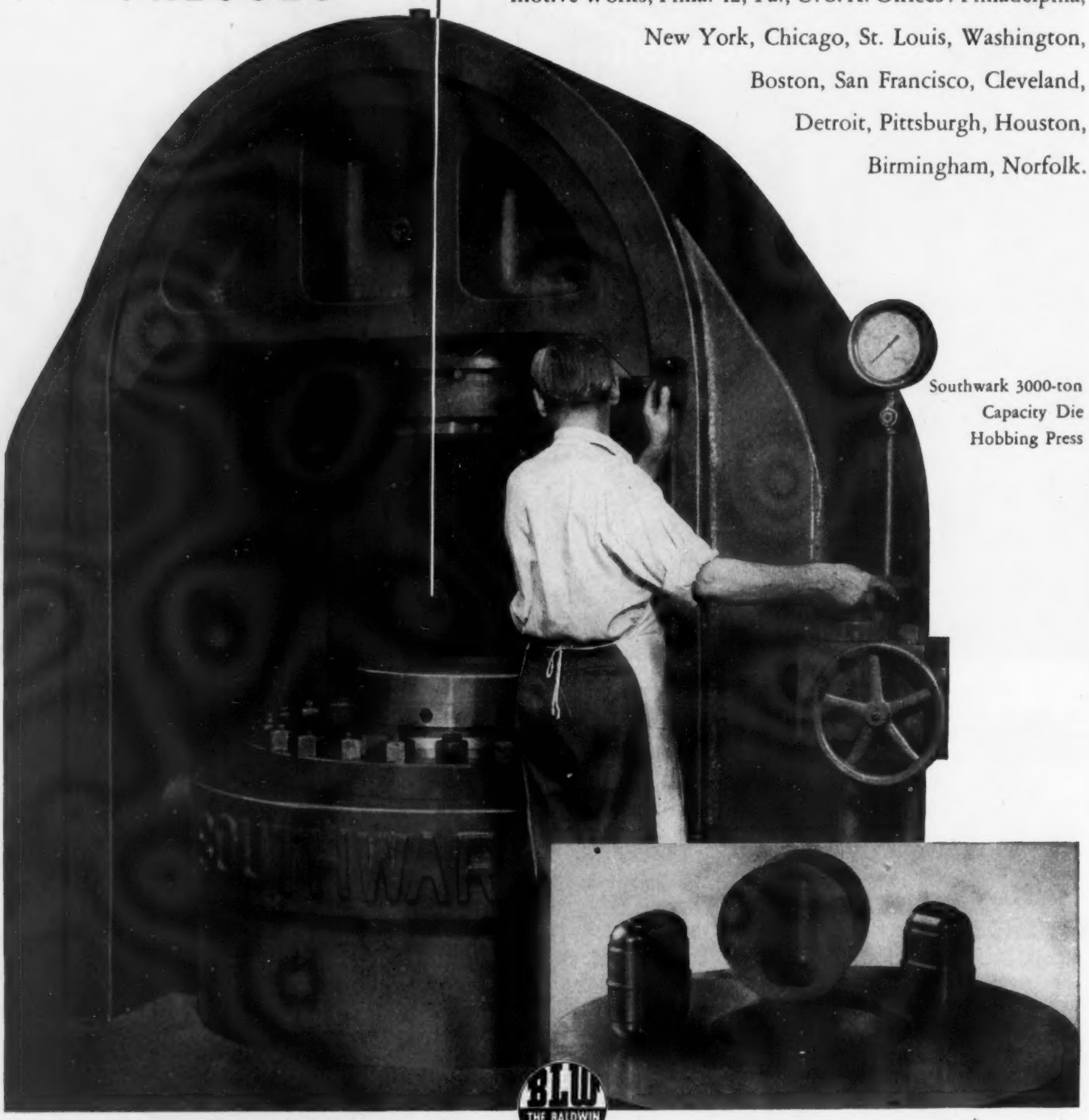

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63-Ton Backup Roll

On Oil Film

HYDRAULIC pressure-relieving devices installed on two heavy-duty roll grinders, 60 in. by 24 ft, in the roll shop of Geneva Steel Co., Geneva, Utah, actually float 63-ton backup rolls on oil by forcing a film of oil between the roll necks and the bearing surface of the neck rests. These attachments reduce the heavy starting load caused by inertia and friction and enable the headstock motor to start the heavy rolls from rest without difficulty. The grinders are built by the Farrel-Birmingham Co. Inc., Ansonia, Conn.

The bearing blocks or gibs of the neck rests are made of cast Meehanite with babbitted bearing surfaces. The bottom gib is bored in place in the neck rest stand and pivoted to insure accurate alignment and uniform bearing against the roll neck. Openings in the bearing surfaces permit the entry of the lubricating oil under pressure.

The gibs are adjusted separately from the front of the neck rests by means of adjusting screws turned by a rachet socket wrench. A graduated dial is provided on each adjusting screw to facilitate the necessary close adjustments.

Oil is supplied to the bottom gib by a separate motor-driven pump. The control for the oil pump motor is interlocked with that of the headstock motor. Pressing the starting button for the headstock motor starts the oil pump first, and the headstock motor starts automatically only after a predetermined pressure is reached. The oil pressure can be varied according to the weight of the roll, and after the roll is started the pressure is reduced to the amount required to provide adequate lubrication to roll neck. The pressure is adjusted by a manually operated valve in the oil line and a gage is provided to indicate the pressure.

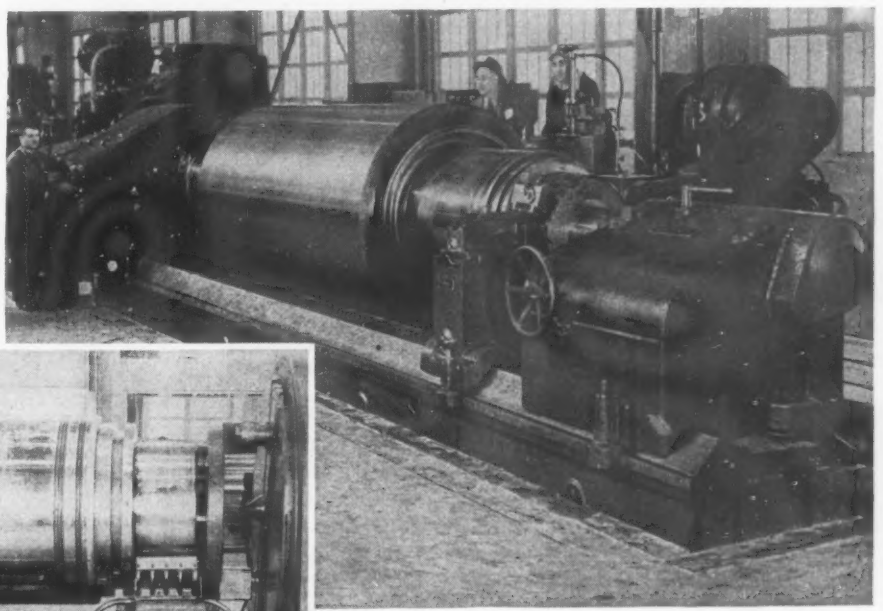


Fig. 1 (top)—Grinding a 59-in diameter by 130-in. face steel backup roll weighing 63 tons

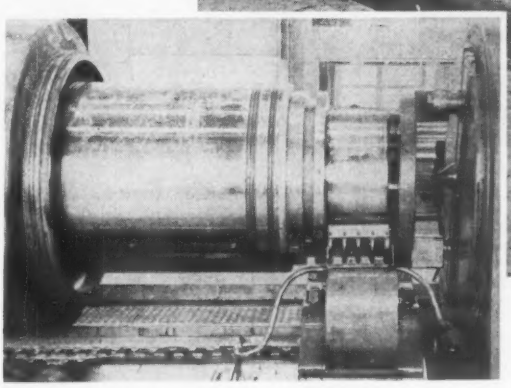


Fig. 2 (bottom) — Closeup of hydraulic pressure relieving device which floats 63-ton rolls on oil film

ASTM Chemical Analysis Metals in Revised Edition

A.S.T.M. Methods of Chemical Analysis of Metals, 1946 edition, cloth, 402 pages, 6 x 9 in.; published by American Society for Testing Materials, 1916 Race St., Philadelphia, for $4.50.

This edition replaces the 1943 volume and gives, in their latest form, the 35 extensive standards developed by the ASTM committees concerned with analysis of metals and alloys. Expanded volume includes not only modernized versions of the various older methods widely used throughout industry but also several of the newer photometric methods and also provides spectrochemical methods of analysis for certain materials and elements.

There are recommended practices covering apparatus and reagents and photometric methods. Extensive methods of sampling and chemical analysis of steel, cast iron, wrought and other forms of iron are included, with methods of sampling and analyzing ferroalloys.

A considerable portion of the new volume is devoted to nonferrous metals, including sampling, chemical analysis and photometric methods. These methods are intended for general use in buying and selling materials according to specifications.

Solvent Cleaner Removes Foreign Matter from Metal

Developed for the removal of oil, buffing compound, organic and solid dirt from all types of metals including active metals such as zinc, aluminum, brass and nickel silver, a new emulsifiable solvent cleaner is being introduced by Enthone Inc., New Haven, Conn. This cleaner, designated as EC-75, reportedly will not harm alkali cleaners when it is dragged into them, actually increasing cleaning ability of these cleaners. According to company, it is self-dispersing, rinses off quickly and requires no heating facilities.

—o—

Instructors in technical schools have been keeping the film produced by Clark Equipment Co., Buchanan, Mich., in constant demand, the company reported recently. It shows close-ups of unusual manufacturing operations with special machinery. Operations such as making one-piece forged axle housing from a single plate formed into a tube, silent blind riveting, twisting high speed drills into spiral form from forged blanks, and various installations of Clark equipment.

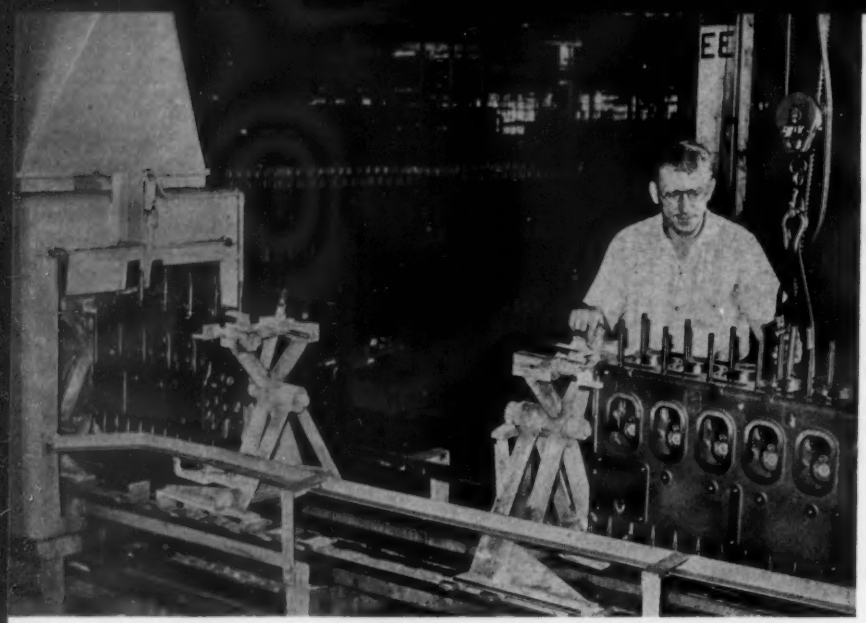


Fig. 1 (left)—Diesel engine blocks are cleaned in an automatic washer through which blocks move horizontally, rocking back and forth on cradles so that all areas are cleaned and foreign matter spills out

Fig. 2 (below)—Heads, after being bored, ground and milled, are cleaned in the washer shown here schematically. They move on an endless chain, turning as they go through a washing spray, rinse and air dryer

CLEANING *Engine Components*

Automatic washing machines remove dirt from diesel engine blocks, heads and smaller parts

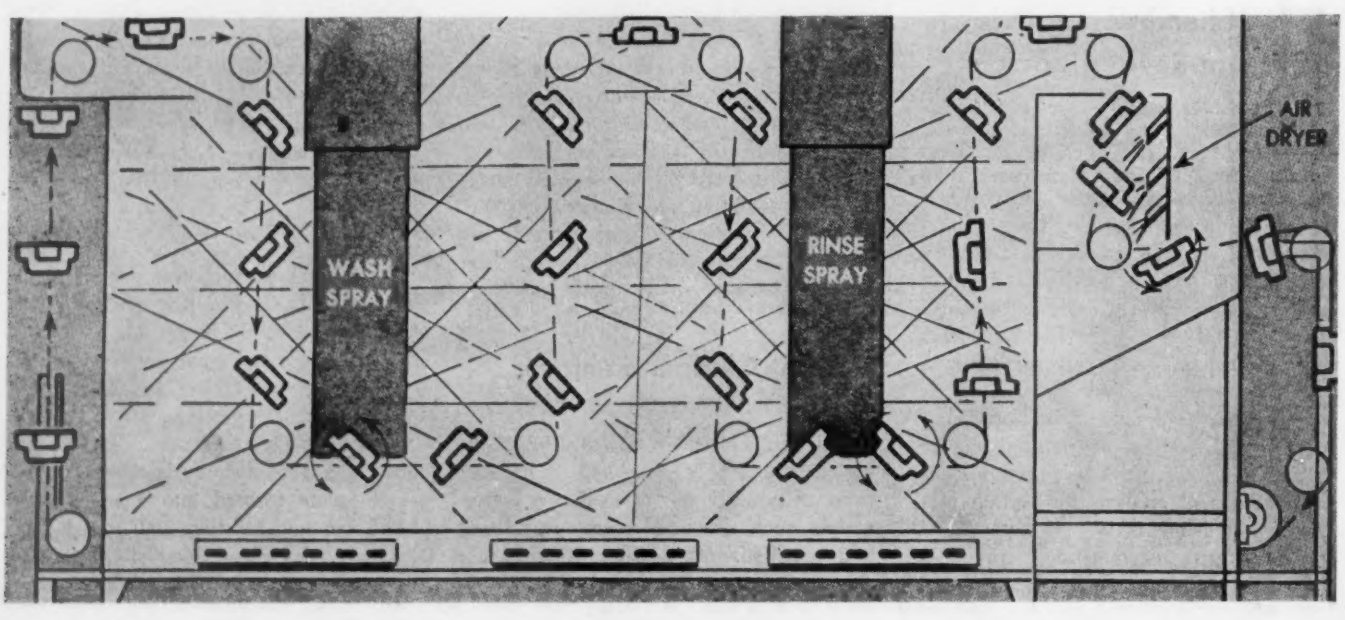
CARE and precision which go into the manufacture of diesel engines require a continuous lookout for foreign substances in manufacturing and assembly operations. At the Detroit Diesel Engine division of General Motors Corp., vacuum cleaners or exhausters draw off the dust and dirt developing in the ordinary process of manufacture, but even this is not enough to have the engine parts absolutely clean for assembly, so the plant's dust laboratory organized a real cleaning job.

First problem was to find places in the plant where dust was heaviest. This was done by placing pans 1 ft square at different places in the plant, leaving them 48 hours, and then collecting and weighing the accumulated dust. Trouble areas were located near milling and boring machines. Large exhaust fans now operate to draw away fine particles, keeping them out of the air, and letting heavier chips fall to the base of machines.

With much of the dust eliminated, it was possible to devote full attention to more thorough washing. Previously it had been the practice to "dunk" parts in a water-and-solvent bath and then to blow the parts dry with manually directed streams of compressed air. A manually controlled electric hoist did the dunking in an open vat.

Although this might loosen much of the dirt, pieces being washed were not

(*Please turn to Page* 139)



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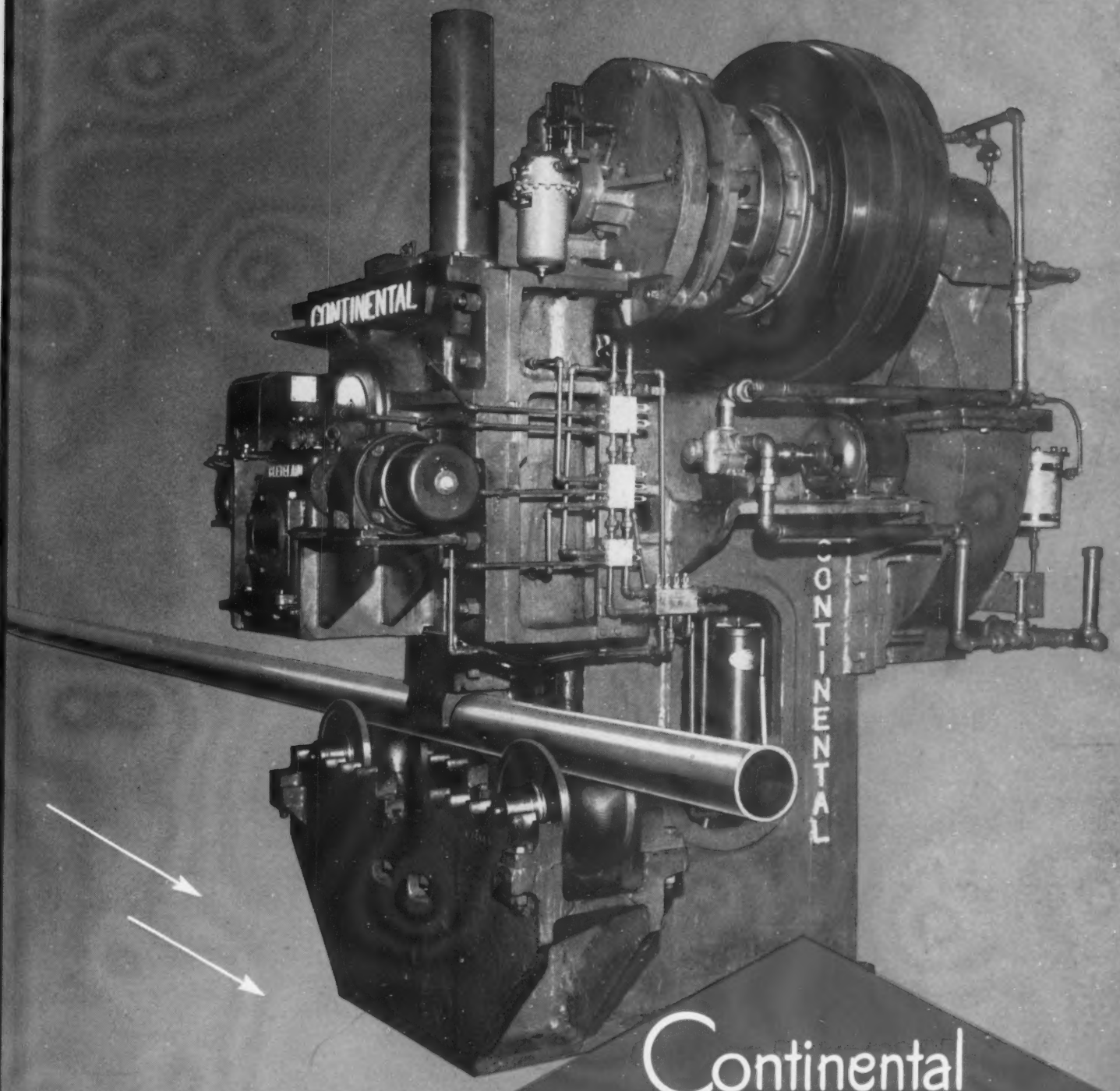

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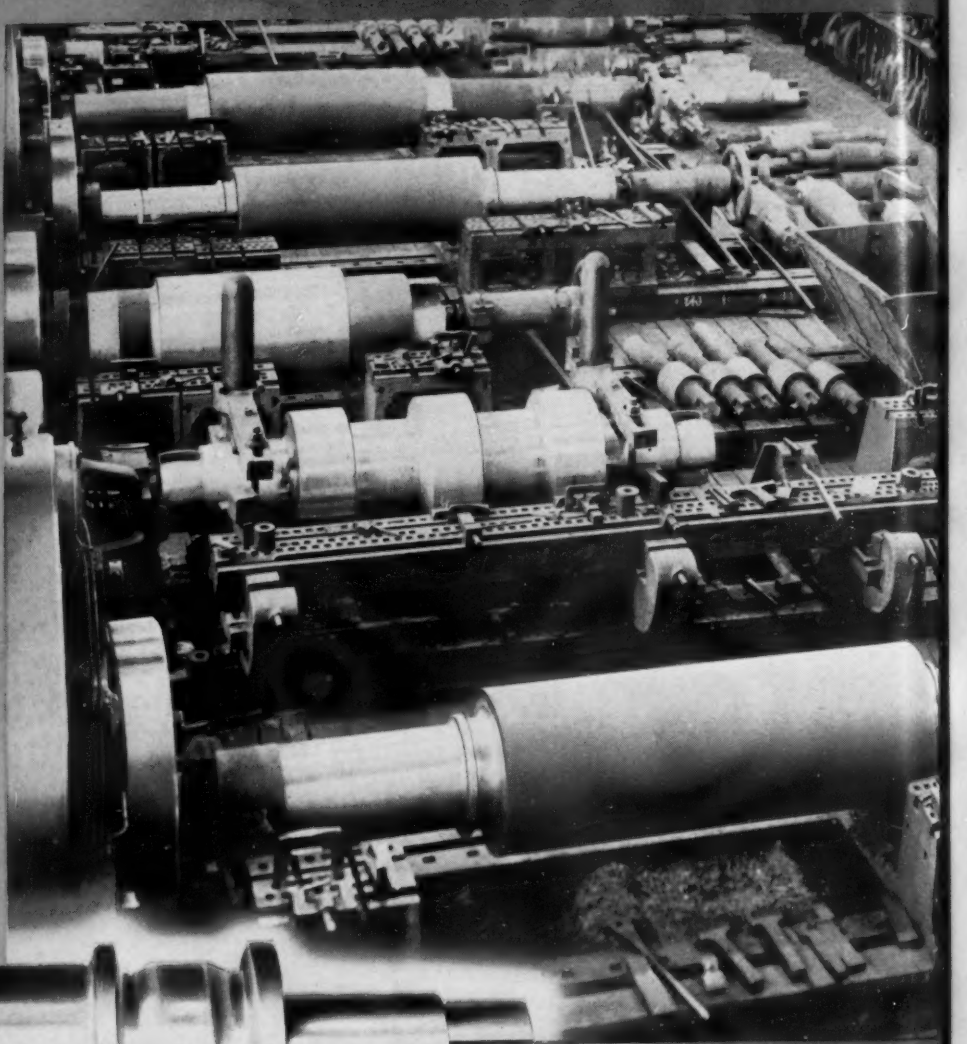
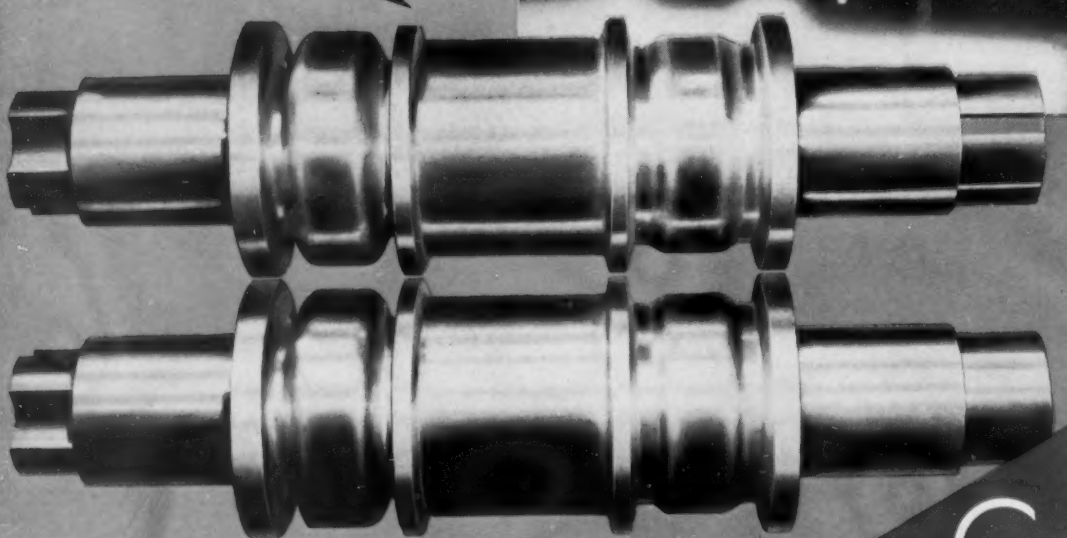


Pittsburgh Roll Shop—one of Continental's *four* strategically located, complete roll shops.



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Heat Treatment

(*Concluded from Page 94*)

may make it impossible to achieve this hardness range even by use of tempering temperatures that are just below critical for steel employed. Thus, consideration of the annealing and softening characteristics of the steel may impose limits on the amount of alloy that can be used for a given part.

How Detrimental is Bainite? The several factors just discussed make it apparent that the initial goal of developing structures that are 100 per cent tempered martensite is not always feasible. Since pearlite transformation (and the associated ferrite transformation) is readily suppressed by relatively small amounts of alloy, these microstructures can be avoided. However, if limitations of the amount of alloy that can be used have been imposed by other considerations, it may be inevitable that bainite be present after quenching the part. This leads to a consideration of just how much inferior in mechanical properties are parts which contain some bainite to those which are completely martensitic after quenching.

A number of oversize Charpy specimens, cut from two heavily alloyed steels, were isothermally treated to develop considerable amounts of bainite in the structure. These specimens were then tempered to a hardness of 240 to 250 brinell (1200 F to 1250 F) and tested. The results may be compared with the results obtained on water-quenched specimens in Table II. At room temperature and even at 0 F, the presence of sizable percentages of bainite prior to tempering resulted in only a minor loss in notched-bar strength. At testing temperatures of minus 40 F and minus 80 F, the loss became conspicuous. The results also indicate that low-temperature bainite (that formed at 650 F) is less detrimental than that formed at a higher temperature.

Standard 0.505-in. tensile bars were similarly treated to contain bainite. The presence of tempered bainite in the final structure caused no significant loss in either tensile strength, elongation, or reduction of area. The yield strength, however, was from 5000 to 10,000 psi lower in four of the six isothermally treated samples than it was in the water-quenched samples. It would appear then that when the amount of alloy that can be used is limited by some consideration, leaner alloy steels which partially transform to bainite during quenching may be used without a large deterioration of mechanical properties.

Acknowledgments: The experimental data used herein were taken from various reports submitted to the War Metallurgy Committee, based on a research program sponsored by the National Defense Research Committee of the Office of Scientific Research and Development as NDRC research project NRC-14.

Grateful acknowledgment is made to the Office of Scientific Research and Development for their support and for their permission to publish this summary, to the War Metallurgy Division of NDRC, and to the War Metallurgy Committee for supervising and directing the research. Thanks are also due to many members of the Battelle staff for their helpful contributions, and especially to Dr. C. H. Lorig for his general guidance.

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2. W. T. Griffiths, L. B. Pfeil and N. P. Allen, "Intermediate Transformation in Alloy Steel." Iron & Steel Institute, Second Alloy Steel Report, No. 24, 1939, p. 343, abstracted in *Metal Progress*, Vol. 36, August, 1939, pp. 158 to 162, and 188.

TABLE II

THE EFFECT OF BAINITE ON V-NOTCH CHARPY VALUES

Treatment[1]	Micro-Structure[2] Before Tempering	Brinell[3] Hardness	V-Notch Charpy Values[3, 4] R.T.	0 F.	−40 F.	−80 F.
Water Quenched[5]	100% Martensite	242	62.5	61	60.5	61.5
10,000 sec. at 800 F.[5]	40% Bainite	243	65	60.5	56.5	51.5
1,000 sec. at 750 F.[5]	65% Bainite	247	54	52	40	27.5
1,000 sec. at 650 F.[5]	80% Bainite	243	63	56.5	56	53.5
Water Quenched[6]	100% Martensite	248	68.5	59	59	55
10,000 sec. at 800 F.[6]	50% Bainite	240	63	56.5	38	29.5
1,000 sec. at 750 F.[6]	65% Bainite	243	60	51.5	29	19.5
1,000 sec. at 650 F.[6]	90% Bainite	247	60	56.5	54	43.5

1. Austenitized for 20 minutes at 1700 F.
2. Balance of structure was martensite.
3. Hardness and Charpy values were determined after tempering. Tempering temperature was adjusted to give a final hardness of 240-250 brinell. All specimens were water quenched from the tempering temperature. Tempering temperatures were sufficiently high that temper brittleness should not have been involved under these conditions.
4. Average of three specimens.
5. Composition was .27% C, 1.50% Mn, .75% Cr, 2.09% Ni, .49% Mo.
6. Composition was .28% C, 2.14% Mn, .65% Cr, .49% Mo.

Maintenance Hints Offered In Spanish and English

Three new booklets of interest to Latin American businessmen are available from Turco Products Inc., Los Angeles. Printed in both Spanish and English, and fully illustrated, the booklets cover fields of general industrial processing and maintenance, automotive and aircraft maintenance and overhaul; including information on new methods, products.

"How to Speed and Simplify Cleaning Methods in Industrial Plants" is concerned with rust removal, water-scale elimination, steam cleaning, paint stripping, metal surface treatment and general maintenance. Automotive and aircraft cleaning and maintenance are the subjects of "How to Reduce the Cost of Automotive Maintenance Through Turco Chemical Methods" and "How to Reduce the Cost of Aeronautical Maintenance Through Turco Chemical Methods."

70 Per Cent More Grinds With Carboloy End Mills

A special method of brazing Carboloy tips is said to increase number of pieces machined per grind by 70 per cent. This process is used on a line of Carboloy tipped milling cutters and end mills offered by Nelco Tool Co., Brooklyn, N. Y. Heavy tips brazed in by this method reportedly will withstand shock, improve tool life and permit many regrinds.

Cutters are of heavy type having a body of a high strength alloy casting. Designs are purposely heavy to create a flywheel action. The company states that these tools will mill steel on machines of old design or low powered machinery.

Two and four flute end mills from ¼-in. to 2 in. diameter, large end mills up to 5 in. diameter with No. 50 NMTB shanks and shell, face and half side mills and slotting cutters up to 8 in. diameter are offered, none of which require special adapters, only standard spindles or milling arbors.

Hot-Dip Galvanizing Practice

By WILLIAM H. SPOWERS Jr.
Spowers Research Laboratories Inc.
New York
President

PICKLING pipe involves the problem of properly cleaning the inside as well as the outside surface. Sulphuric acid is universally used and many plants agitate or roll the pipe in the acid to prevent air pockets from forming. In some cases the technique is carried to the point of continuous pickling. As a matter of fact, batch pickling, if properly handled, is sufficiently effective.

The usual water wash is augmented by storage water tanks in cases of maximum production. Also the No. 20 neutral flux tank is next in line. In pipe and tubing the flux is carried at a higher degree Baume because of the larger ingo-area to be covered and the fact that the operation is one of high tonnage, requiring a heavy head of volatile flux on the bath.

In the case of conduit where bending is of great importance the same rule as in wire prevails as to the use of fully silicon-killed stock.

The kettle is dammed lengthwise in the center with a removable dam to give freedom for drossing. The pipe or tubing is fed sidewise into the kettle continuously and is held in suspension in the bath by means of guide rods which control the roll of the pipe from the ingo side to the outgo side of the kettle.

On the outgo side only, another dam is placed crosswise in the kettle, about 3 ft from the end from which the pipe is withdrawn. Within these 3 ft no covering can be placed but on the remaining portion of the outgo side a blanket covers the exposed molten metal to prevent the formation of oxides and avoid excess heat loss. Reference to this arrangement is made later.

The pipe is withdrawn from the kettle by the potman by means of a hook and

Fig. 43—Discharge end of galvanizing pot showing length of coated pipe on its way to cooling rack

Fig. 44 (below)—Installation for galvanizing bolts. Galvanizing kettle is shown at right and centrifugal spinner in foreground

placed on a magnetic separator and inside a ring wipe drilled for the release of superheated steam which effectively wipes the outside of the pipe. During this wiping process the pipe is being carried up an incline by magnetic rollers and as it reaches the top of the incline, it settles into a bell which releases a blast of steam into the interior of the pipe thus wiping the inside of the tube. It is then released from the bell and rolls down a runway into water in which it remains only long enough to thoroughly set the zinc coating. Automatic revolving sheaves lift the pipe from the water onto the shop truck for transfer.

The important phase of this operation is to form the guide rods in the kettle so that the pipes are removed in the same rotation as they entered. It will be seen that if any pipe "nests" in the kettle, such pipe will acquire a heavier coat than the others. This is the difficulty with "batch" immersion in the pipe coating operation. In some plants compressed air plungers are used to submerge the pipe more rapidly on entrance. In such cases the batch enters the bath as a unit but the first pipe out has a lighter coat than the last. However, the plunger type affords rapidity and where operation is in some cases constant enough to make the irregular time of immersion of small consequence.

In this operation the handling of the pipe through the kettle being a rather constant procedure the weight of coat is controlled mainly by the degree of metal fluxing, temperature of the zinc and pressure of the steam wipe. Sufficient flexibility can be had for these procedures to control the coat within the limits required.

It may be noted here that in galvanizing any work such as pipe, range boilers, barrels, etc., where interior surfaces are to be coated, inhibitors must be used to permit of thorough cleaning and the neutral flux technique must be adopted. Only by such procedure can presentable and first-class results be accomplished on the interior of the work.

Galvanizing of Pipe Fittings

Two standard methods are followed for galvanizing pipe fittings, namely, basket method and mechanical basket method.

Cast-iron and malleable pipe fittings must be pickled in a special casting-grade of hydrofluoric acid the strength of which depends on the condition of the fittings as received from the foundry. It is most desirable that they be sand-blasted for if this is done they may be pickled in trays in light acid. If this is not done, they must be pickled in heavy acid in a tumbling barrel. The reason for this is that the acid does not dissolve sand, it only loosens it. This silicious material must be removed by agitation for no amount working in the zinc can effect a successful galvanized coat over sand.

Inhibitors can be used economically in this acid and are especially effective when the shop is pickling sandy castings.

The fittings then are washed in clear running water and immersed in No. 20 neutral flux. All of these fluids are carried hot. The hydrofluoric acid is held at a temperature calculated from capacity of equipment over tonnages over strength of acid. The water and flux are maintained at about 130° F.

On removal the fittings are placed in baskets. In the standard basket method they are immersed in the zinc manually and moved along the kettle by means of long handles. In the mechanical method the baskets are hooked onto a screw bar which is mechanically rotated

over the center of the kettle lengthwise. The bar is not threaded for the last few feet of travel in order that the baskets may be brought to rest within grasping distance of the potman.

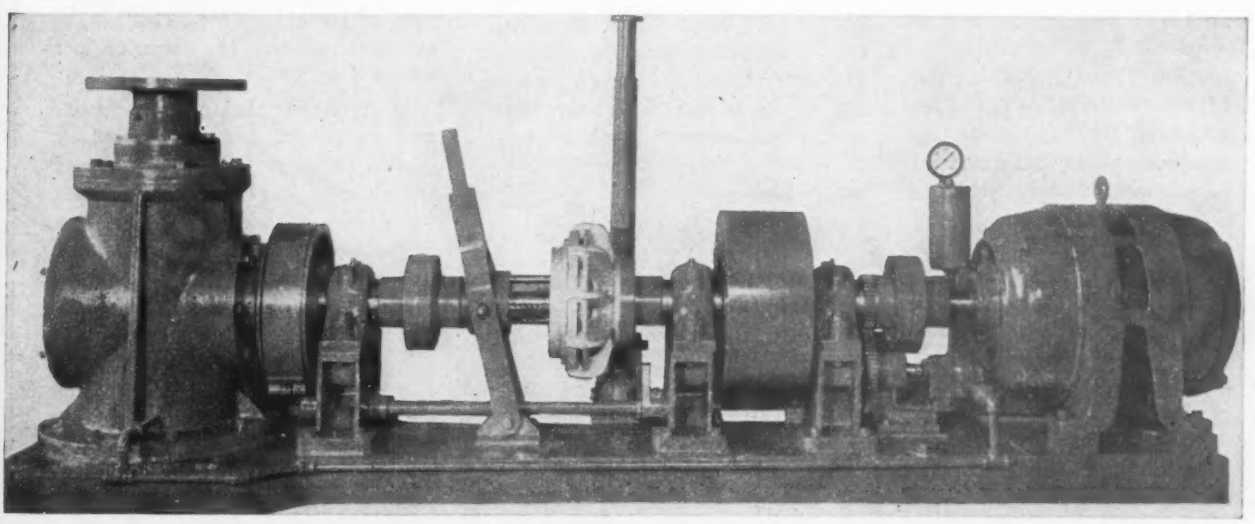
When the potman grasps the handle of the basket, he raises it by leverage on the side of the kettle, jars it several times, lowers it back into the zinc, skims the zinc with a skimmer, lifts it out through the skimmed zinc and dusts it with fine white sal ammoniac. The basket then is dumped, the fittings dropping softly into the quench.

This quench is important. A desirable luster cannot be obtained unless a suitable film is carried on the water. Also the fitting must not be left in the quench except to set the zinc. The quench tank is equipped with an automatic ejector.

The technique just given offers a high-production method and perfect results. Some shops still adhere to the old fork

Fig. 45 (above)—Perforated basket in which galvanized parts are subject to spinning action of a centrifugal machine

Fig. 46—Centrifugal machine for removing excess zinc from surface of galvanized parts. Pedestal at left imparts centrifugal motion to basket containing parts



method of dipping the fittings in batches of 6 to 12, according to size, suspended individually on the forks. However, due to the advent of the high-fired kettle, fittings may be galvanized just as nicely in baskets and with much greater tonnage results.

This operation is the highest dross producer in the galvanizing industry. The best that can be recorded even with an installation of ample capacity is 15 per cent of the new zinc used. Many plants, still operating on the old technique with small kettles, average from 40 to 50 per cent dross. At one of the largest fitting plants in this country a 63 per cent dross loss was traceable to faulty settings and the use of an incorrect quality of zinc for galvanizing the various type of fittings.

Some operators offering individually inspected fittings of extra fine finish with threads galvanized use centrifugal machines into which the baskets are lowered immediately after being taken from the zinc. The basket then is revolved quickly, the centrifugal force eliminating all excess metal and leaving the threads clear and clean.

While centrifugal cleaning results in a fitting or bolt with clean threads and, if properly quenched, of high luster and quality, it is not 100 per cent perfect. The fittings or bolts must be rigidly inspected after the operation is completed. The operation requires also an acid stripping tank in which the baskets must occasionally be stripped.

Although capable of satisfactory tonnage centrifugal operations are rather costly both in operating labor and residuum losses. A full production unit will require several more men to operate the transfer of the baskets, the machine itself and the quench. The metal slingings in most cases, are so high in oxide and low in fluid metal as to make the use of a separator necessary, and the residuum from the separator must be sold as zinc ashes.

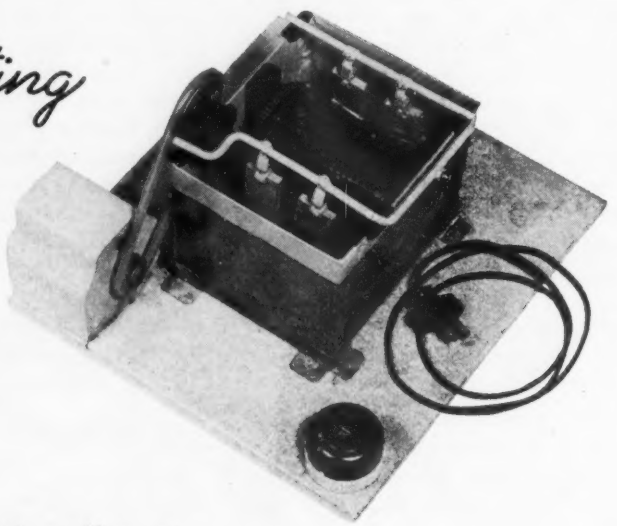
Some operators place the slingings back on top of the molten zinc under the zinc. As a matter of fact, however, this mode of procedure is wasteful because this residuum is high in oxide. The result of such practice is that large quantities of oxides pass off in fumes and are lost entirely.

The most economical method of handling slingings from a centrifugal unit is by the use of a separator. The residuum from this operation is in the form of fluid zinc and zinc oxides. The fluid zinc may be remelted in the bath while the oxides must be sold as oxides.

Generally, the use of the centrifugal machine from the standpoint of economy must be restricted to definite classes of work involving clean threads, small articles, telephone cable hangers etc., where the necessity of removing excess zinc is apparent and on which a heavy dense coat such as can only be obtained by the hot process is required. On this class of work a relatively high price per pound prevails in order to cover the expense of the operation.

(*To be continued*)

Economical Electroplating of Small Parts



USING the small barrel-plater shown in the accompanying illustration, engineers at Hamilton Watch Co., Lancaster, Pa., are electroplating quantities of small parts, without large or cumbersome equipment and large volumes of solution. Plater also makes it possible to try new and experimental plating solutions under simulated production conditions without requiring the use of more than 1500 cu cm of solution.

Entire assembly of the micro-barrel plater is mounted on a noncorrosive base, one foot square. A removable tank of stainless steel, coated on the inside with an acid-alkali-resistant insulating material prevents current loss and possible attack on the metal by corrosive solutions. Two battery connectors on each side of the barrel provide for making contact and holding the anodes in place. Clamps also make possible any necessary quick change of metal and anode-cathode area ratio.

Plating barrel is constructed of hard rubber, perforated to allow the free flow of solution in and out of the barrel. Round metal tumblers are fastened to the inside of the barrel to provide cathode contact and to tumble the metal parts for uniform plating. In cases where immediate contact and circulation are advisable, the electric motor and current for plating can be turned on and the barrel containing the parts can be placed in slots and dropped easily into the proper place.

Small Motor Provides Power

Simultaneously, gears are meshed and the cathode contact is made so that plating will begin immediately. Power to rotate the barrel is furnished by a small electric motor and carried to the bottom of the tank through a train of hard rubber gears. Space is provided for a specially designed immersion heater and thermocouple for automatic control of warm or hot solutions.

In production plating of small parts an extra barrel is used with the plater so one lot of parts can be prepared and placed in the barrel while another lot is being plated. It is reported that with proper adjustments good results are obtained in plating cadmium, nickel, gold, silver, indium, cobalt-nickel, and copper from conventional solutions. Other metals, such as zinc, can no doubt be plated with equally satisfactory results when using this small barrel-plater.

For lower operating costs . . . with controlled-atmosphere furnaces specify B&W REFRACTORIES

Holcroft & Co., one of the leading manufacturers of controlled-atmosphere furnaces, give a typical field report on the profitable performance of B&W Refractories. They point out that the use of B&W 80's for hearth supports and B&W I.F.B. for furnace linings has given maximum furnace life and reduced fuel consumption in atmospheric furnaces. In other words, *lower production costs* for the furnace operator.

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Third—B&W 80 Firebrick are designed for unusually severe service conditions. Their high hot-load strength insures long life under severe temperature and load conditions such as experienced in hearth supports.

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Inert Arc Welding

(*Continued from Page 82*)

with conventional pressure gages and a flow meter. A flow meter is often needed because, in some cases, the inert gas pressure required for welding is so low that gage measurements are not adequate.

The manual electrode holder is shown in more detail in Fig. 4. This holder grips the tungsten electrode, guides the inert gas so that it will envelope the arc and conducts the welding current to the electrode. It is light, easily handled and is capable of accommodating up to ¼-in. diameter electrode. Similar holders, for both manual and automatic operation, are available wherein the electrode grip and gas nozzle are water cooled. Used of water cooling makes possible greater values of welding current or lower rates of electrode consumption. Higher welding currents permit faster speeds of welding or, in some cases, increased weld penetration.

Use of a high-frequency pilot spark is very desirable for starting the arc but its use is not recommended during welding. The pilot spark makes it possible to establish an arc without touching the electrode to the base material, thus elimnating the risk of contaminating the electrode. In many cases, contamination of the electrode will result in a wild, uncontrollable arc and inclusions in the weld. Use of a pilot spark for starting, is suitable for either manual or automatic operation.

Magnesium: A great deal has been written concerning the helium-shielded arc welding of magnesium and magnesium alloys. In a majority of the cases reported, direct current, reverse polarity, was used with excellent results. Magnesium alloy, ASTM designation B90 alloy A261X, (Dowmetal J-1) has been successfully welded by using argon gas and a conventional alternating-current welding transformer supplemented by a circuit to overcome rectification. The object was to determine the maximum amount of penetration which might be achieved in one pass when using a square groove joint in stock thicknesses of about 1 in.

It was found that the maximum amount of welding current that could be used with a ¼-in. diameter tungsten electrode was about 200 amp. Above this value, violent expulsion of metal from the molten pool occurred. Since the value of welding current was limited, the maximum amount of penetration possible was about 1/4 to 5/16 of an inch.

The inert-arc welding process makes it possible to weld magnesium and its alloys in virtually all thicknesses and using all types of joints without a flux. It is felt that unless some equally satisfactory and less expensive method for welding this material is developed, the inert-arc welding process will have excellent possibilities, in the field of magnesium fabrication, offering means for advancing the use of magnesium in industry.

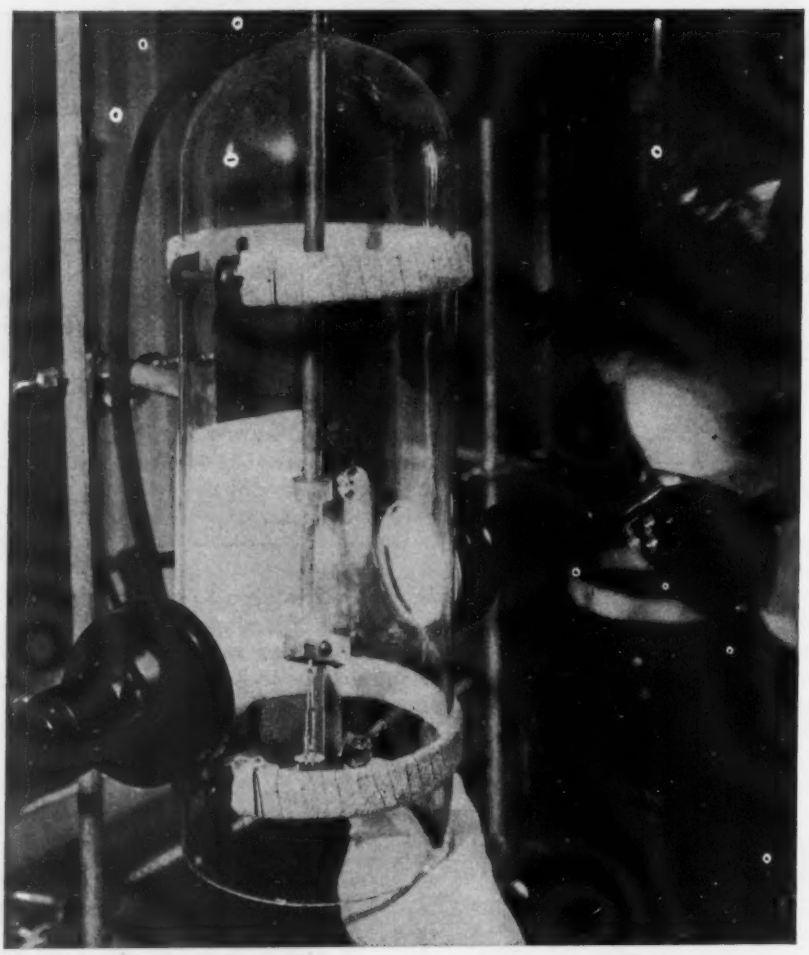
Stainless Steels: Research in this field has been confined essentially to the use of direct-current, electrode negative, on thin austenitic stainless alloys of types 321 and 347. Both argon and helium are suitable as inert gases when welding these materials, but argon is preferable for thin sections.

One example of the application of the inert-arc welding process to the welding of stainless steels is the expansion joint for use in high temperature applications that is illustrated in Fig. 2. This joint is made up of two 1/32-in. thick, type 347 stainless steel formed halves, argon-shielded arc welded together at the outer circumference.

Two formed halves of the expansion joint were assembled for welding in a fixture which was attached to a suitable rotating mechanism for moving the work under a stationary electrode holder. A 1/16-in. diameter tungsten electrode and 75 amp direct current, electrode negative, were used. Arc was established using a high frequency pilot spark arrangement and the time required for welding a joint of 6 in. outside diameter was approximately 40 sec.

The flexing load applied to such a joint demands a smooth cross section at the location of the weld, in order that failure due to stress concentration will not occur. This means that the transition from the base material to the weld must be smooth and not vary appreciably in thickness. Fig. 3, a photomacrograph of a representative cross section of the welded joint, shows that this requirement was very adequately met.

The automatic atomic hydrogen weld-



HIGH TEMPERATURE WELDING: Tungsten filament is being welded here to tungsten supports on a VT90 ultra-high frequency transmitting tube at the Brooklyn, N. Y.. plant of Amperex Electronic Corp. Work is done in a bell jar filled with forming gas which prevents oxidation of the metal. Heat and light generated by the arc are intense, so operator wears dark glasses during the process. Two spot-lights at sides of jar provide visibility for striking the arc

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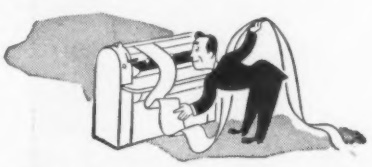

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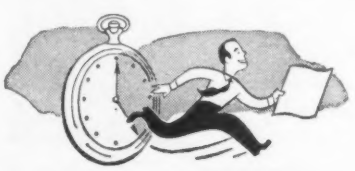

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beautiful continuous-tone prints from film positives (which can be made from any negative) . . . OZAPLASTIC to produce oilproof, waterproof prints for salesmen's booklets, etc. *All* prints are made in same fast, economical manner.

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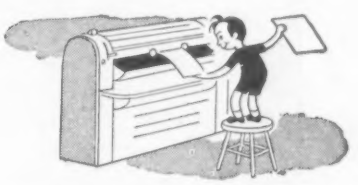

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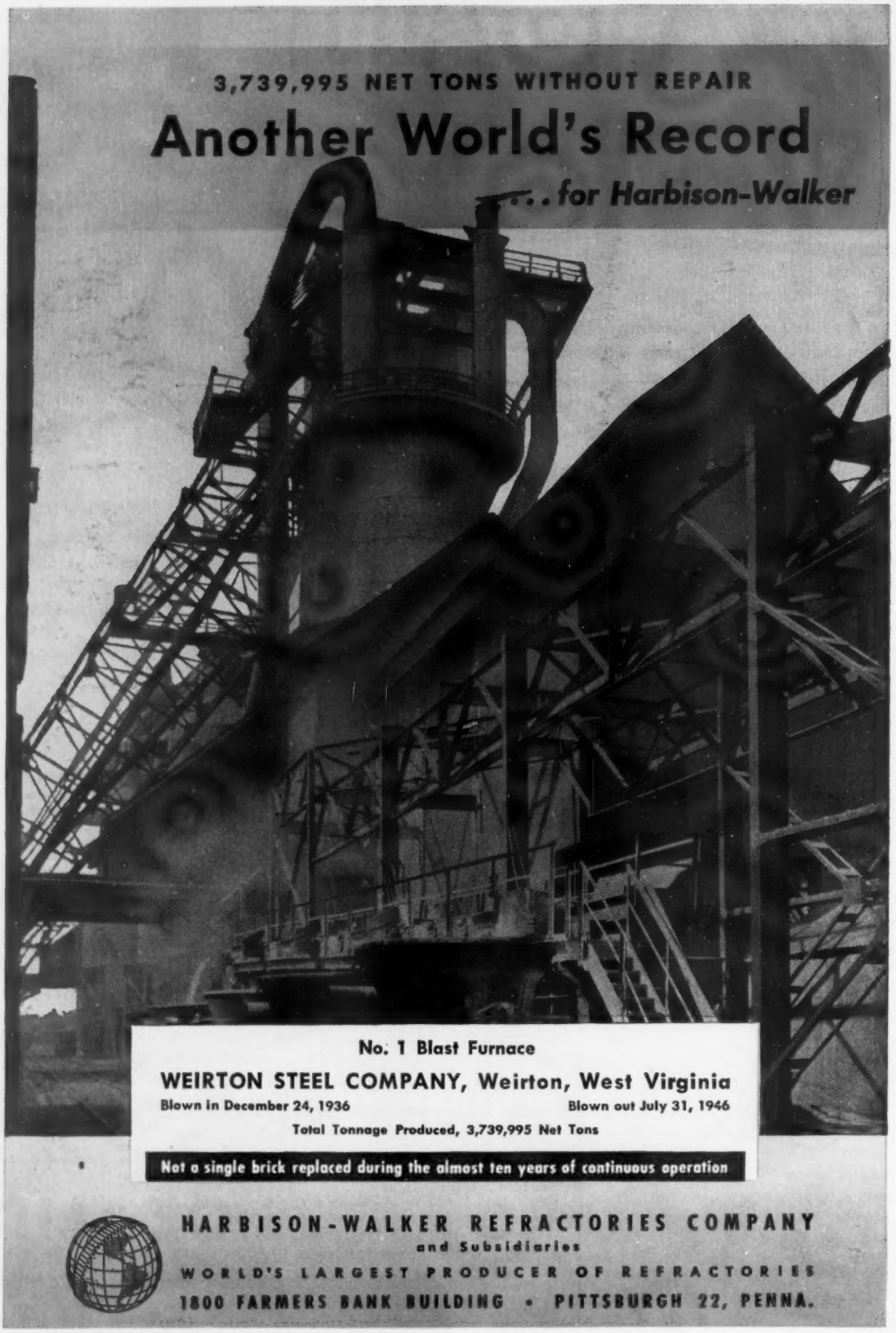
3,739,995 NET TONS WITHOUT REPAIR
Another World's Record
. . . for Harbison-Walker
No. 1 Blast Furnace
WEIRTON STEEL COMPANY, Weirton, West Virginia
Blown in December 24, 1936
Blown out July 31, 1946
Total Tonnage Produced, 3,739,995 Net Tons
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ing process might have been equally suitable for this application. It was felt however, that because of the relatively low anticipated production rate of these expansion joints, it would be difficult to liquidate the higher cost of the automatic atomic hydrogen equipment. This example serves as an illustration of the specialized field the inert-arc welding process will probably occupy in the fabrication of stainless steels. The field will be one limited by the economics of the process as compared with that of others which are equally suitable for any given application.

Aluminum: Corner, lap, tee and butt joints in aluminum and many of its alloys, in thicknesses varying from 1/32-in. to 1-in., have been successfully welded using the inert-arc process. Physical properties of welds in some of the heat treatable alloys are considerably superior to those obtained when using the gas welding processes.

Procedures have been developed whereby single pass, square groove welds having complete penetration can be made in thicknesses up to at least 3/4-in. Photomacrograph, Fig. 3, shows a single pass, square groove weld in 13/16-in. 14 ST material. This weld was made using a 3/8-in. diameter tungsten electrode, held in water cooled grip, and the welding current was supplied by a conventional ac welding transformer supplemented by a circuit designed to overcome rectification. Approximately 560 amp ac were used.

Aluminum and many of its alloys are readily weldable by the inert-arc process, and because flux is not required and the resulting distortion is low, this process is preferable to either atomic hydrogen or the gas welding processes. As in the case of magnesium, the insert-arc welding process will have an excellent future in the fabrication of aluminum in industry.

Copper: This material is readily weldable by the inert-arc process. Tests have indicated that welds in other than oxygen-free copper will exhibit some porosity and low ductility in the bending process.

It is felt that this process will find some application in the fabrication of copper, but silver brazing and carbon arc welding will probably be used more than the inert-arc process for some time to come.

Nickel-Chromium Alloys: In general, at the present stage in research, helium gas with direct-current, electrode negative, has been found to be the most suitable combination for welding nickel-chromium alloys. The principal advantage in using the inert-arc welding process with this group of materials is that flux is not needed. Flux is usually required when using the atomic hydrogen or gas welding processes.

The inert-arc process offers fabricators of nickel-chromium alloys an excellent tool to supplement those already in existence. It is quite certain that this process will be used for many applications where these materials are to be welded.

PLANETARY MOTION

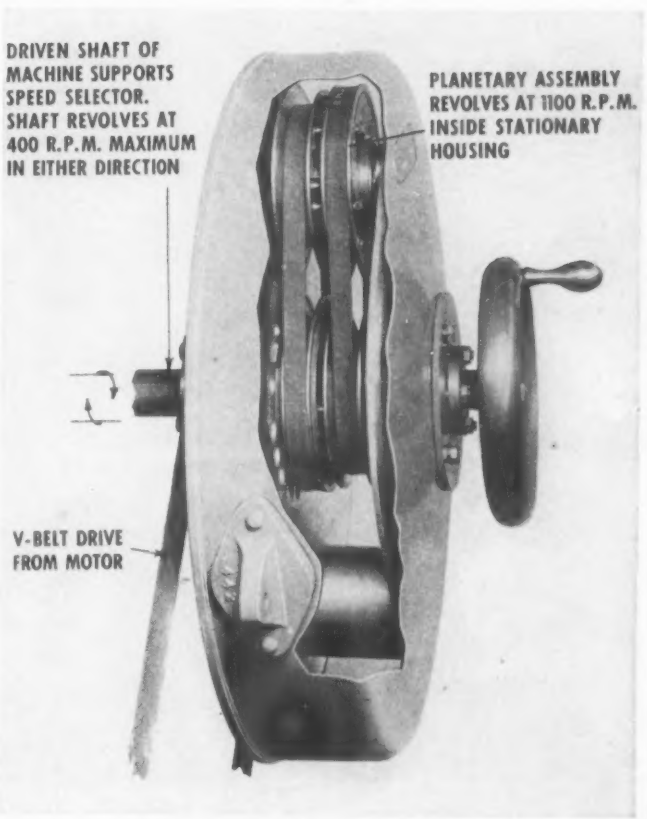
....Used in new speed selector

INFINITE ratio, stepless speed from full down through zero and into full reverse at constant torque of 2 hp capacity is provided by two standard cross-section V-belts and four variable pitch pulleys in this new development of planetary motion designed by Speed Selector Inc., Cleveland. A slight change in the variable pitch pulleys of the device, known as the variable-V-planetary speed selector, brings a large change in output speed through the multiplying action of the planetary mounted on the motor or driven shaft of the machine on which it is used.

In operation, the planetary system compares ratios of two V-belt drives and applies difference in speed to output shafts. With ratios equal, the difference in speed and output shaft speed is zero. If ratio of one drive is greater than the other, the output shaft rotates forward at a speed proportionate to the difference in ratios. If ratio is less, the output shaft operates in reverse in the same proportionate ratios. Speeds from 400 rpm to zero, forward and reverse can be obtained.

All changes are made by a hand control wheel which alters pitch diameter of the center pulleys so that as one is increased the other is decreased; change is imparted to outer pulleys by wedging action of the V-belts. Hand control wheel is mounted on input shaft of the driven machine by a tapered collet. Wheel thus controls diameter of all four pulleys without use of springs or complex linkages.

The variable-V-planetary will be merchandised by B. F. Goodrich Co., Akron. Among machine applications suggested are lathes, grinders, milling machines, process machinery, drill presses, conveyors and agitators.


DRIVEN SHAFT OF MACHINE SUPPORTS SPEED SELECTOR. SHAFT REVOLVES AT 400 R.P.M. MAXIMUM IN EITHER DIRECTION
PLANETARY ASSEMBLY REVOLVES AT 1100 R.P.M. INSIDE STATIONARY HOUSING
V-BELT DRIVE FROM MOTOR

Industrial Equipment

Surface Illuminator

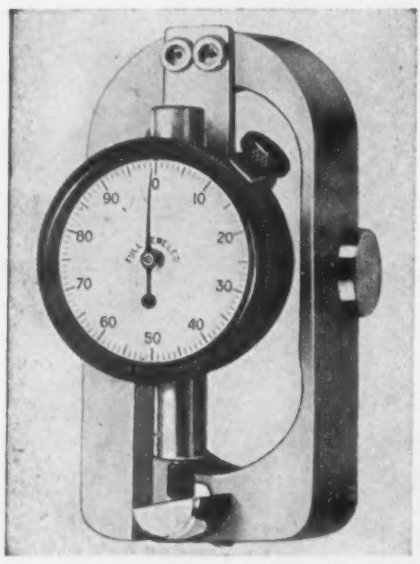
Ring of eight low-voltage bulbs, mounted in an extremely compact circular lamp house which completely surrounds the projector lens supplies the light in the new Wilder surface illuminator manufactured by George Scherr Co., 200 Lafayette street, New York 12. High intensity light is directed vertically against surface of work piece and gives uniform illumination over full area of lens and screen without shadows. Illuminator is shown at left with Wilder micro-projector. It is removable from lens, although it may remain in position without interfering with projection in transmitted light. Image can be produced jointly in transmitted and reflected light. Illuminator is fully self-contained, being operated through a constant voltage transformer.

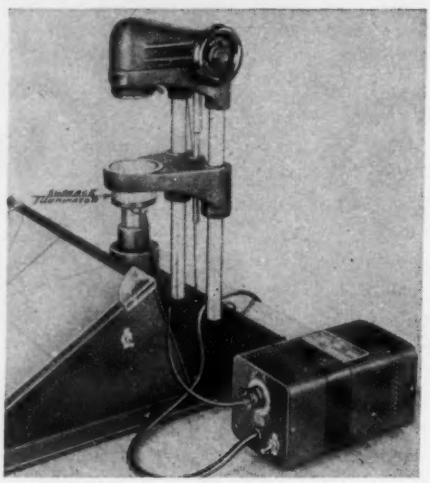
Steel 11/18/46; *Item No.* 9953

Pressure Gage

Designed to fit into tight places where pressures of static or moving parts must be measured, mechanical pressure gage shown directly below, designed by W. C. Dillon & Co., 5410 West Harrison street, Chicago 44, can be used to check pressure between spot welding machine electrodes, between platens in all types of presses, between moving rollers and tension in a moving thread or wire. Offered in 0-100, 0-250, 0-500 and 0-1000 lb models, gage can be used in vises, between clamps or can be converted into a miniature testing machine. Remote repeater stations that work up to 500 ft from gage can be supplied.

Steel 11/18/46; *Item No.* 9911





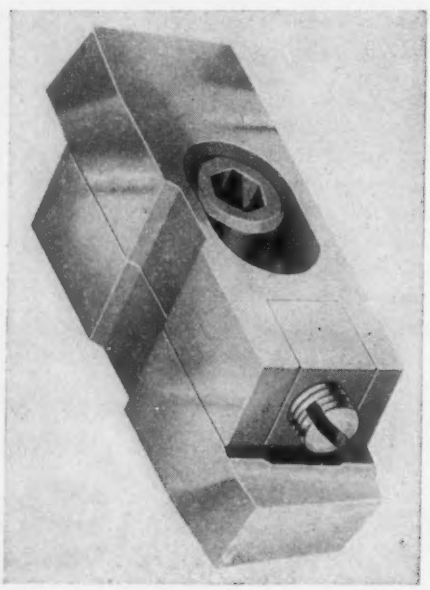
Rough Boring Tool

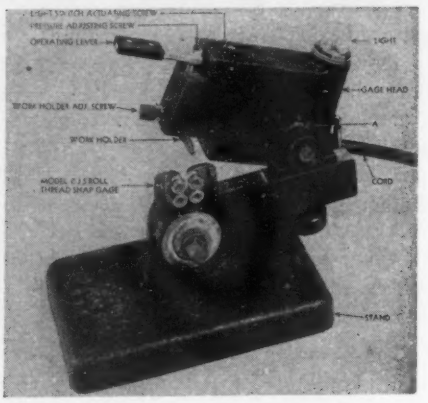
Blades form the cutting block of a new block type rough boring tool (directly below) developed by Madison Mfg. Co., Spring and Bauer streets, Muskegon, Mich. Advantages of tool are quick changing of cutters, adjustment of cutter size before mounting in bar and centering of cutter in bar automatically, equalizing load on cutting elements. Single micrometer thread screw expands both blades equally from centering slot on blades, a screw driver being used for this operation.

Steel 11/18/46; *Item No.* 9935

Work Positioner

Increased efficiency and worker productivity is possible with the Powrarm universal positioner, announced by Garfield Engineering Corp., Kansas City, Mo. Virtually all kinds of benchwork may be positioned for production, assembly, service and maintenance, allowing use of



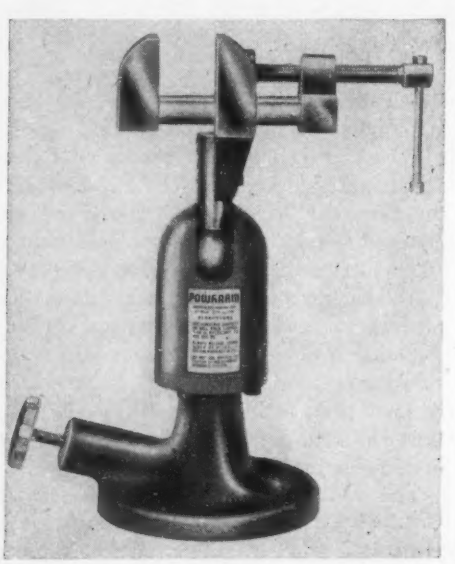


both hands on all operations. Positioner provides access to all sides of work and it may be rotated 360 degrees and turned at angle on horizontal or axial planes and 180 degrees on vertical planes. Work position may be changed quickly and locked by adjustment of pressure control knob which applies pressure to a ball and socket joint. Device, shown below, is produced in both hydraulic and mechanical models. Attachments permit mounting many types of work.

Steel 11/18/46; *Item No.* 9952

Roll Thread Comparator

Built for thread inspection on screws of diameters ranging from 0.060 to 0.-216-in. and threads of 80 to 28 per inch National Form 60 degree, the Model C comparator (shown above) developed by Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford, Conn., has a pressure control feature which relieves operator of responsibility of judging border line cases. Screw is placed in work holder and held on its major diameter. Operating lever is depressed and screw is presented to gaging rolls.



(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 124.)

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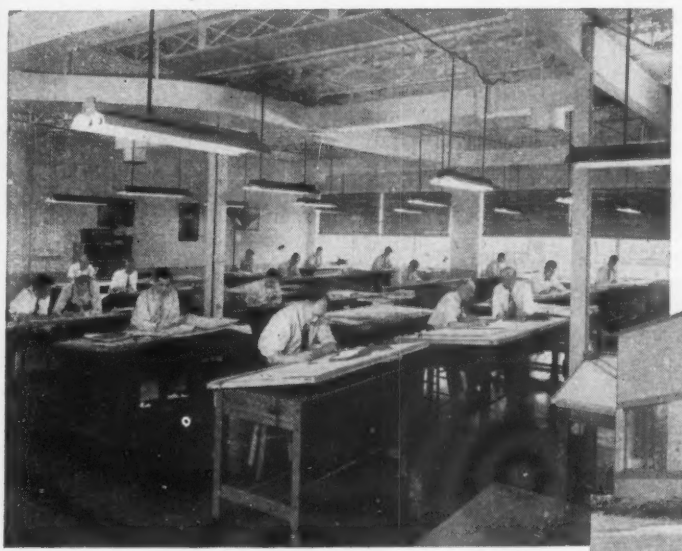

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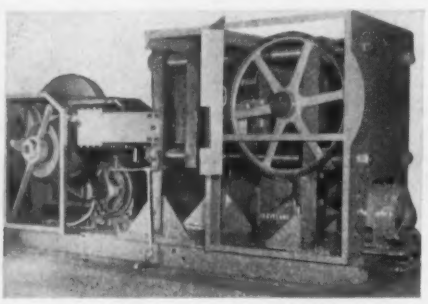
Signal light is always on except when excessive pressure is applied. Correctly threaded screws pass "go" rolls without resistance (light on) but will not pass through "not go" rolls (light goes out). Oversize screws meet resistance at "go" rolls (light goes out) while undersize screws go through both rolls (light stays on) Gaging pressure is adjustable to suit the work. Check is on pitch and minor diameter, lead, angle.

Steel 11/18/46; *Item No.* 9954

Die Casting Machine

General Die Casting Corp., Oakland, Calif., features a new mechanical method of die casting utilizing a machine which casts all nonferrous metals. A cold shot machine, it has a die closing pressure of approximately 3,000,000 lb and



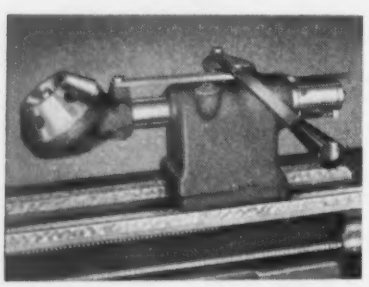
an injection pressure of about 90,000 lb. Castings produced have unusual density and freedom from defects.

Machine uses relatively small amount of power—two 7½ hp motors. Maximum capacity area of casting is 350 sq in. Injection capacities are: Aluminum base alloys, 6 lb; copper base alloys, 16 lb; zinc base alloys 13 lb; lead, 20½ lb.

Steel 11/18/46; *Item No.* 9770

Tailstock Turret

New tailstock-type handlever turret that provides turret lathe efficiency to its 9 in. lathes on jobs which require a number of successive operations is being produced by South Bend Lathe Works,



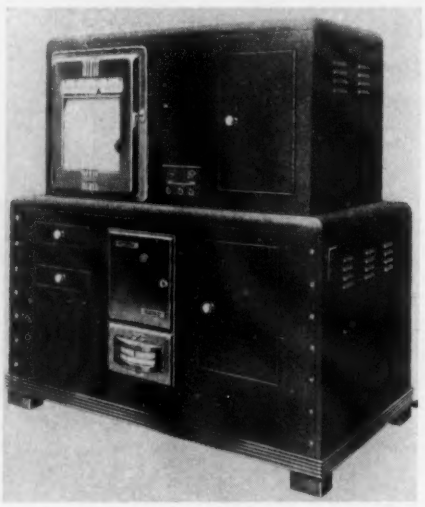
South Bend 22, Ind. Turret mounts on the inside ways of bed in place of the tailstock, its 6-station head accommodating tools with 5/8-in. diameter shanks.

Length of cut at each station is regulated by means of an adjustable set screw while stop mechanism is geared to operate automatically in unison with the indexing of the turret head. Index lock releases automatically at the end of the turret slide's return stroke and indexing is done by hand. Operations are repeated, or skipped, at will. Turret slide has a maximum stroke of 3¼ in.

Steel 11/18/46; *Item No.* 9769

Dilatometer

Automatic dilatometer for continuous 12-hour recording of thermal expansion and contraction of a wide range of materials including metals, is announced by Electronics Division, Sylvania Electric



Products Inc., 500 Fifth avenue, New York. Instrument provides a high degree of sensitivity and accuracy.

Besides eliminating the plotting of instant values, densitometer permits determination of true variations in length even when samples exhibit exceptions to rule of elongation as a function of temperaure.

Dilatometer includes a furnace or subzero cooling chamber, furnace thermocouple, concentric quartz tube; specimen thermocouple, gearbox and support, transmission, contact mechanism, electronic relay, and recorder. It holds specimen temperature uniform within 1°C, and is capable of accommodating 3, 4 or 5-in. specimens up to 1000°C.

Steel 11/18/46; *Item No.* 9746

Multiple Drill Head

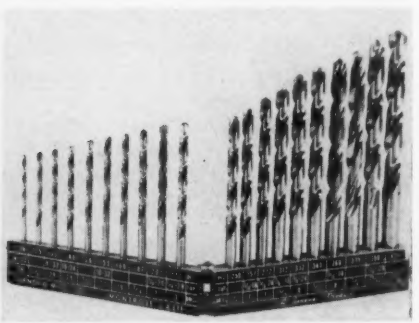
Gear driven, multiple adjustable drill head in which each drill revolves completely around two different centers is offered by Wisconsin Drill Head Co., Sturtz & Mead Inc., Milwaukee, distributors. With each drill revolving around two different centers, each with a 15/16-in. radius, each drill point can be located at any point in area of a 3¾-in. circle.

As each circle overlaps at least one other circle, an infinite variety of hole patterns which can be produced is limited by the number of spindles and the combined area of the various spindle circles. A set of templates is furnished with each head for every hole pattern or bolt circle which may be drilled. Multiple drill head is made with two to six spindles.

Steel 11/18/46; *Item No.* 9751

Drill Stand

Holding 20 of the most commonly used tap and body drills—fractional, letter and number—from 0.106 through 0.437-in. (6-32 through 7/16-in. x 20), the drill stand manufactured by Geneva Mfg. Co., Montrose, Calif., includes



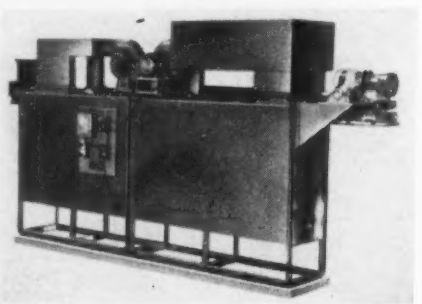
easily read designations under each drill to show decimal, tap and drill sizes.

A feature of the light-weight anodized aluminum stand is that when stand is closed, drills are held firmly in place and will not fall out, even if stand is turned upside down.

Steel 11/18/46; *Item No.* 9774

Air Dryer

Machine designed to dry loaded racks continuously before or after plating, or after any other type of water-solution dip, has been introduced by Optimus Equip-



ment Co., 177 Church street, Matawan, N. J. It is continuous in its operation, and works almost completely closed. It also can be connected to an exhaust blower, and any heating system, steam, gas, or

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 124.)

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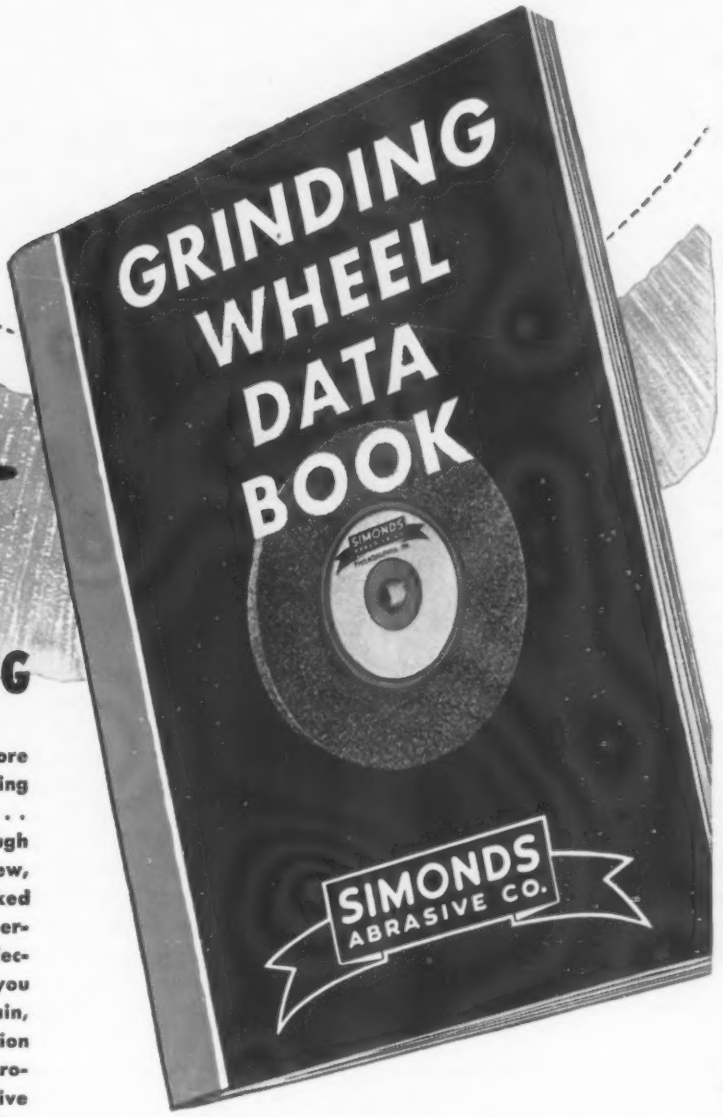

Grinding wheel selection tables . . . rules for more efficient operation . . . instructions for easy ordering . . . suggestions, short-cuts and illustrations . . . everything to give you the most in savings through top grinding wheel performance is yours in the new, revised Simonds Abrasive Data Book. 127 fact-packed pages of complete up-to-date information on performance-proven Borolon (aluminum oxide) and Electrolon (silicon carbide) products . . . information you need to help you select wheels of the right grain, grade, structure and bond for maximum production results on every operation from roughing to micro-inch finishing. Get your copy of Simonds Abrasive Data Book today. Completely indexed for easy reference, it is your guide to better grinding results on every material from carbide to plastics. In addition to the Data Book, you will find Simonds Abrasive Distributors and Abrasive Engineers in your vicinity helpful in recommending the right wheels for your specific jobs.

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electricity, can be employed. Drying time is usually from 4 to 6 min.

Dryer can be used as a single-stage dryer or in connection with a number of successive operations, alkaline, acid or neutral.

Steel 11/18/46; *Item No.* 9780

Radioactivity Measurer

Tracerlab Inc., 55 Oliver street, Boston, announces the Autoscaler, an instrument for making quantitative measurements of radioactivity. Line-operated, it supplies the high potential for a Geiger-Mueller tube, counts impulses from this tube, and measures the time required for reception of a given number of impulses. Self-calibrating instrument is automatic in operation with no internal adjustments.

Impulses from Geiger counter are fed to a preamplifier, a 2-stage amplifier, and then a multivibrator which triggers first of a series of 12 "scale by two" counter circuits. Latter is selected by number of impulses from 2 to the second power to 2 to the twelfth power—i.e., 4 to 4096 in integral powers of 2.

Measurement of the time interval required for the accumulation of the selected number of impulses is accomplished by an output amplifier and cathode follower stage which actuates the clutch of the timer.

Steel 11/18/46; *Item No.* 9748

Indicating Light

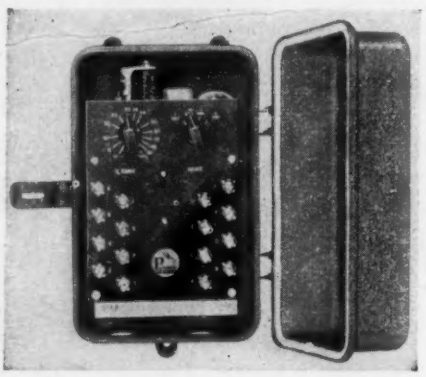
H. R. Kirkland Co., Morristown, N. J., announces a new lighting device of an indicating nature, known as the ML unit. Molded entirely of bakelite, the basic lampholder housing can be furnished for use with one, two, three or four S6-120 v bulbs. Slots are provided as an integral part of the case to hold light isolation barriers. They can readily be withdrawn to permit lamp servicing.

A variety of light face plates are available. Momentary contact and on-off push switches which light up, can be used with or without markings. Overall plate dimensions are 3¾ x 1½ in. with 3 x 1 1/16 in. alloted to light area.

Steel 11/18/46; *Item No.* 9736

Electronic Timer

An electronic type 30HLI timer, is being manufactured by Photoswitch Inc., 77 Broadway, Cambridge 42, Mass. for repeat-cycle operation of process control and machine timing. It can



be used to control intervals of 1/20 sec to 4 min, providing four basic types of timing: Interval, delayed action, automatic repeat and programming. All are incorporated into the one timer and may be utilized by changing external connections to the terminal board.

Instrument also features a selector switch that provides five time intervals. Accuracy variation is less than 2 per cent. Basic circuit is self-compensating for voltage variations. Employing but one tube and one relay, timer operates on either 115 or 230 v supply line.

Steel 11/18/46; *Item No.* 9777

Overheating Signaller

Device designed to indicate transformers which are overheated is being marketed by Eastern Specialty Co., 3617 North Eighth street, Philadelphia 40. Named the Thermalarm, it is thermally operated, and is attached to transformers by an adhesive cement.

Projecting from rear of device is a die-cast aluminum base which acts as a heat transmission medium and which is placed in contact with transformer. Case encloses a thermally responsive element which controls a latch releasing a flag, normally held in downward position and which, before operation, has the same color as rest of case. Upon release of latch, the spring-actuated flag reverses itself and presents a brillant red surface, readily visible from ground.

Device is adjustable over range from 100 to 200° F. Adjustment is made by turning indicator screw on face of instrument to desired temperature setting. Entire device weighs but 3 oz.

Steel 11/18/46; *Item No.* 9734

Strip Mill Rolls

Kennametal Inc., Latrobe, Pa., announces development of solid rolls for cold metal strip mills capable of producing more strip before regrinding is necessary. They roll thinner, harder materials satisfactorily, maintain accurate gage consistently and impart a superior finish to the strip.

High modulus of elasticity of rolls provide more effective resistance to deflection under high pressures. Uniform, close-grained physical structure of the rolls can be given a mirror-like polish

FOR MORE INFORMATION on the new products and equipment mentioned in this section, fill in this form and return to us. It will receive prompt attention.

Circle numbers below corresponding to those of items in which you are interested:

9953	9774	9779
9911	9789	9933
9935	9748	9750
9932	9736	9765
9954	9777	9772
9770	9734	9749
9769	9744	9743
9746	9715	9761
9751	9693	9601
	9778	

11-18-46

NAME ..... TITLE .....

COMPANY .....

PRODUCTS MADE .....

STREET .....

CITY and ZONE ..... STATE .....

Mail to: STEEL, Engineering Dept.—1213 West Third St., Cleveland 13, Ohio

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on this page.)

JAL-TREAD

The sure, safe footing provided by Jal-Tread checkered floor plate reduces worker tension, increases efficiency in plants and factories. The straight-line pattern of Jal-Tread makes it easy to fabricate, bend and weld for all applications. Jal-Tread is available in the lighter weight Junior Jal-Tread too. Write for descriptive booklet.

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PENNSYLVANIA

EC&M Magnets give a LIFT wherever needed

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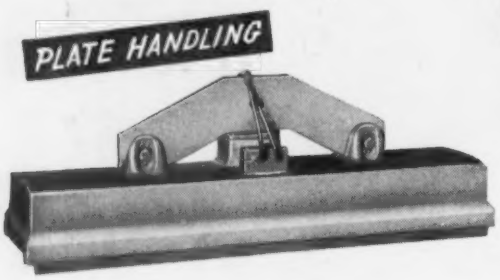
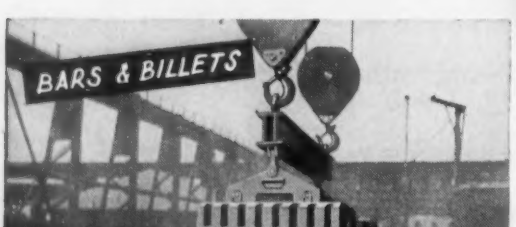
For odd jobs, specific jobs, and heavy, continuous duty applications — **for your every requirement**—we offer you the right size and type of magnet. Throughout nearly 50 years, we have built magnets to improve operations and reduce handling costs in foundries, steel mills, scrap yards, warehouses, and other places.

For heavy duty service such as handling scrap, pig iron, and nail kegs on a tonnage basis—Type SW All-Welded Circular Magnets. Streamlined design—high lifting capacity—watertight coil within a watertight housing. Bulletin 900.



For specific applications—used singly, in duplicate, or in triplicate on a spreader beam for long plates or other materials—Types P & F Rectangular Magnets. Sturdy, dependable, low maintenance. Bulletin 903.

For reaching into corners of plants and railroad cars, between machines and through narrow aisles—Type R Circular Magnets can be mounted on crane trucks making mobile units. Supplied in five sizes. The 29-inch diameter magnet, shown, receives 36-volt power directly from the truck. Sizes are available for all types and makes of crane trucks. Bulletin 904.



For hot or cold billet and rail handling—Type BR Magnets with circular-wound coils assuring great strength and high magnetic efficiency, also free circulation of air around coils. Bulletin 901.

Use the following coupon in sending for helpful literature on magnets suited to your needs.

THE ELECTRIC CONTROLLER & MFG. CO., Dept. 18
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Please send me Bulletin ☐ 900 ☐ 901 ☐ 903 ☐ 904

Name.....

Company.....

City.....Zone.....State.....

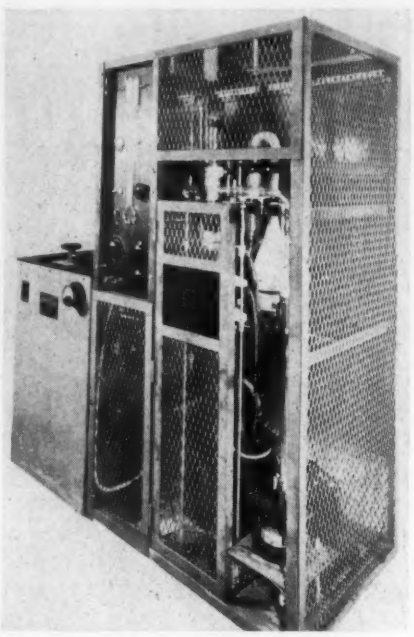
which is imparted to the strip. Rolls have nongalling properties—resistance to pick-up of carbide grains that roughen the surface.

Steel 11/18/46; *Item No.* 9744

Melting Apparatus

Less than 10 min is required for analysis of oxygen content of open-hearth melts with the oxygen determination apparatus manufactured by Central Scientific Co., 1700 Irving Park road, Chicago 13.

A sample is poured into a mold and a piece of this sample is weighed and introduced through a mercury vacuum lock into an induction furnace operating under vacuum. At a temperature of 2800 to 3000° F, the sample melts in 20 sec, and all oxides are reduced by carbon present in graphite furnace crucible. Resulting carbon monoxide is then accurately measured, and per cent of oxygen is computed from a simple equation.



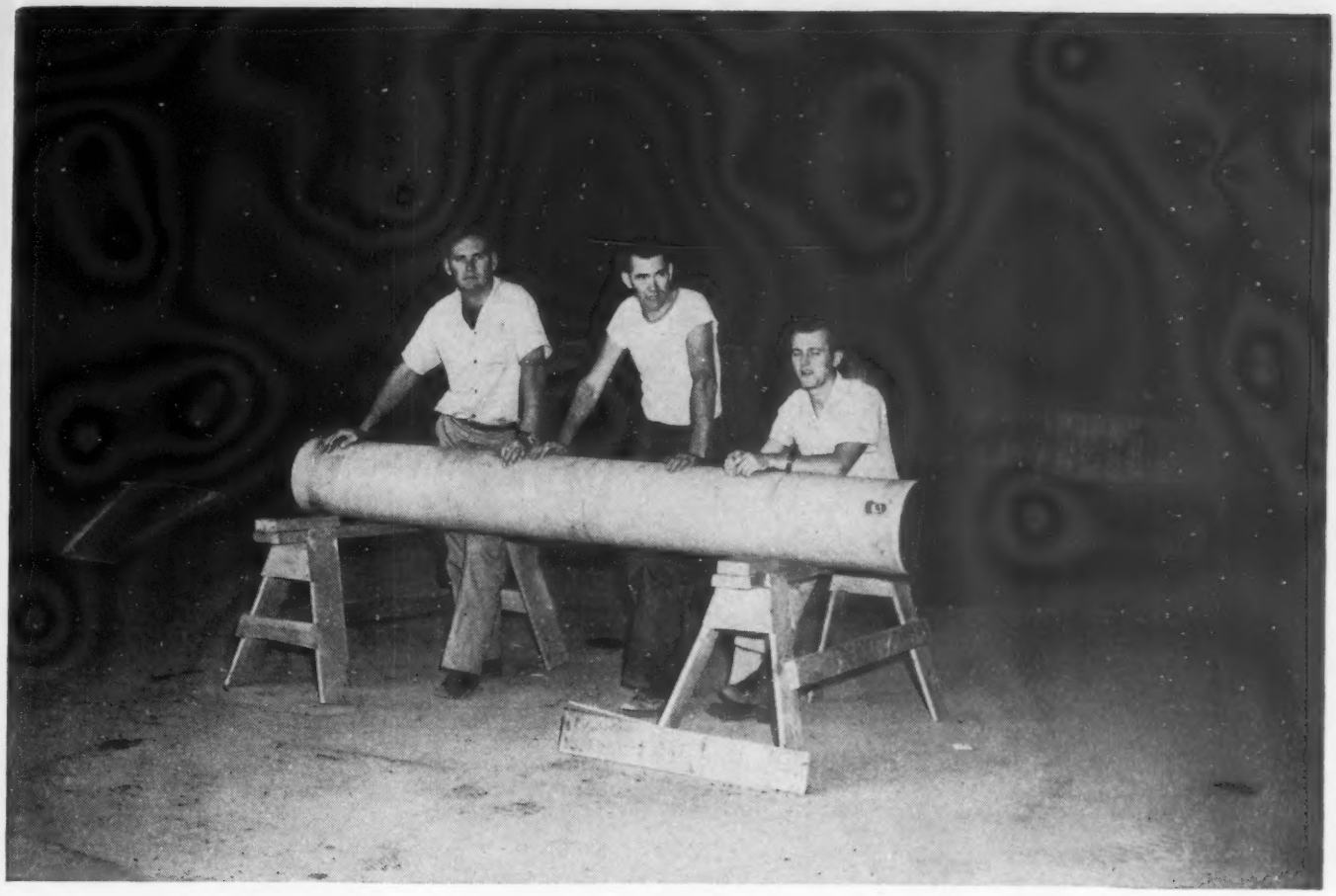
Apparatus is enclosed in a steel frame, protected both electrically and mechanically. A compact, high-frequency converter, operating at 220 v, 60 cycles, supplies the power for the induction furnace.

Steel 11/18/46; *Item No.* 9715

Molding Press

Newest plastic molding machine manufactured by Watson-Stillman Co., Roselle, N. J., is a semiautomatic molding press of 100-ton capacity. It is suitable for either compression or transfer molding. Degassing control by time rather than limit switches allows complete range of die opening and ready adjustability.

Press is arranged and machined for



Another Accomplishment for

A-L SPECIALLOY STEEL SERVICE

The light-colored central portion of the WAC Corporal, above, is a three-compartment vessel for the rocket's liquid propellents: oxygen in excess of 2000 p.s.i., red fuming nitric acid and aniline each in excess of 600 p.s.i.

The builders, after engineering and eliminating all the ordinary materials, consulted Allegheny Ludlum for steels with unusual physical properties which could be obtained in the completely fabricated vessel. We made recommendations and backed them with laboratory test and weld data, on the basis of which the engineers made their designs and placed their orders for material: one grade of Allegheny Special Alloy Steel in two thicknesses of flat stock for the higher and lower pressure vessels; another grade of Allegheny Stainless bar stock for fittings; and the necessary stainless wire for welding.

The plates and sheets for the vessels were held to closely controlled analyses in order to favor the ultimate in physical properties, consistent with fabricating demands. Equally important, Allegheny Ludlum research technicians worked closely with the builder in establishing the technique and procedure of fabrication, heat treatment and hydrostatic test.

The essential points to be made are that the WAC Corporal functioned as planned—and that Allegheny Ludlum Research did, too. Whenever you want steels to do what ordinary materials can't do, in the handling of high pressures, heat, corrosive or erosive influences, etc., call on the Allegheny Ludlum Technical Staff to help you.

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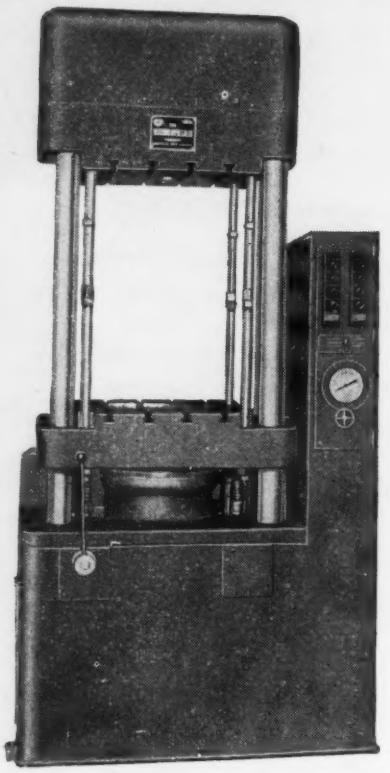
attachment of top transfer cylinder, which is optional equipment. Open four column construction provides maximum dissipation of heat. This construction also permits full accessibility to molds.

Die space of press is 20 x 21 in. and stroke is 12 in. Operating pressure is

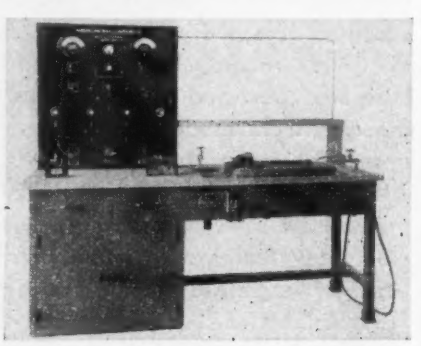


2200 psi. Speeds are: Advance, 260 ipm; pressing, 13.5 ipm; and return, 220.0 ipm. Capacity of top cylinder is 25 tons and the unit is powered by a 5 hp. motor.

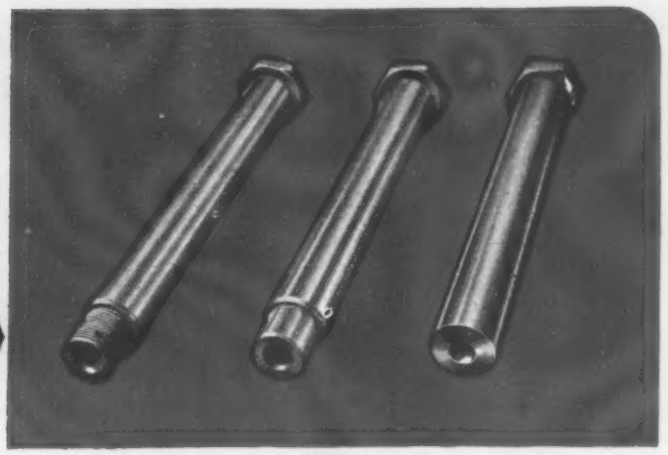
Steel 11/18/46; *Item No.* 9693

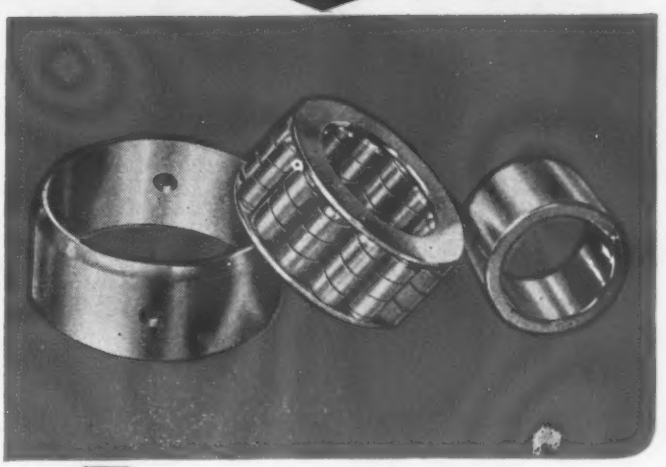
Plating Table

Hanson-Van Winkle-Munning Co., Matawan, N. J., announces development of Diggin electroplating control table, a complete miniature plating laboratory designed for either routine control of



plating solutions or exacting research work on electroplating problems and processes. With this instrument, test panels are plated under closely controlled conditions so that results of addi-





lighter,

stronger parts

at lower cost with B&W tubes

HOLLOW structural assemblies or precision working parts made from B&W Mechanical Tubing give *lightweight* construction with *heavyweight* ruggedness and dependability. Warplane design demonstrated this fact and peacetime aircraft production will reap the benefit. In hundreds of other post war products, too, where lightweight ruggedness is important, B&W seamless and welded mechanical tubing offers practical design and production short-cuts that are worth looking into.

Take a moment to study the few parts shown here. All were made of easily-worked, dimensionally-accurate B&W Mechanical Tubing. Most of them were formerly made from costly-to-handle bar stock or forgings. Check into the possibilities of B&W tubing for speeding production on *your* products—and making important savings in time, costs and materials.

From its modern specialty tube mills, B&W can supply mechanical tubing—either seamless or welded—of the proper analysis, size, gauge, temper and finish for making practically any hollow machined or fabricated part. Let us know what you plan to make and we will gladly tell you how B&W Tubing can save you time and money.

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THERMOIL-GRANODINE

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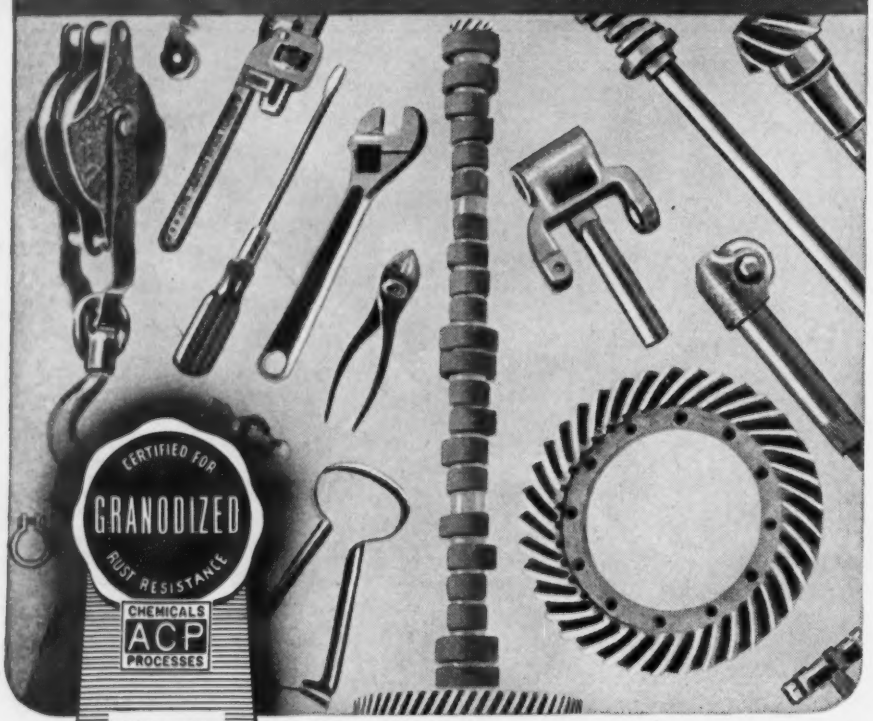

*THERMOIL-GRANODINE creates on steel an oil-absorbing, paint bonding, crystalline coating of iron and manganese phosphate, integrated with the base metal.

CORROSION RESISTANT

—THERMOIL-GRANODINE treated surfaces, when oiled, prevent rust and corrosion and provide a durable foundation that tenaciously holds organic finishes. Thermoil-Granodine is also excellent rust protection for tools, nuts, bolts and unpainted replacement machine parts.

FRICTION MINIMIZED

—THERMOIL-GRANODINE coatings, when oiled, maintain lubrication and prevent excessive wear on friction parts—eliminate break in troubles when new friction parts are run at high speed or under heavy pressure. Thermoil-Granodine provides an ideal coating on piston rings, gears, tappets, valves, camshafts, spiders, etc.

Cold SPRAY-GRANODINE

Cold SPRAY-GRANODINE may be *applied at room temperature* and provides a uniform, smooth zinc phosphate coating—a superior base for lustrous, enduring paint finish. Cold SPRAY-GRANODINE is of special interest to fabricators of automobile bodies, fenders, refrigerators, cabinets and in general for the proper preparation of sheet steel products for durable and lustrous finishes.

* Trade Mark
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AMERICAN CHEMICAL PAINT CO.
AMBLER ACP PENNA.

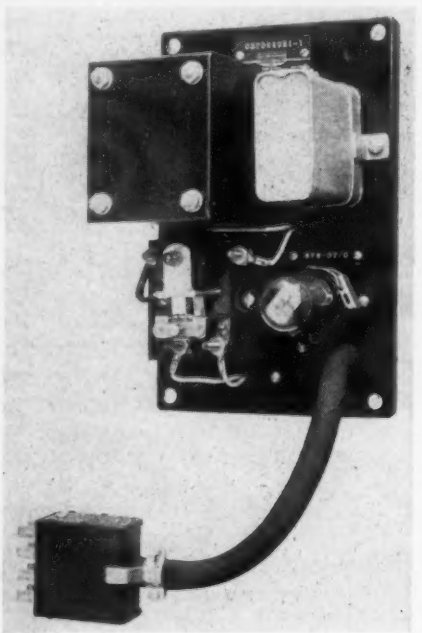
tions, impurity removal treatments and variations in operating conditions can be observed. Only a few hundred milliliters of electrolyte are required to conduct these tests.

Above the working space are mounted all instruments and service outlets required for electroplating tests. Cleaner control section of panel consists of an ammeter, a carbon-pile rheostat, an on-off switch and a switch shunts-out the rheostat. Specimens are prepared for plating, rinsed or given special treatments after plating in glass cells. Each plating position is normally fitted for the delivery of 15 amp, equivalent to 273 amp per sq ft on a 1 x 4 in. bent cathode test specimen.

Steel 11/18/46; *Item No.* 9778

Limit Switch

Designed for tube mill thrust block or draw bench carriage return applications, the new limit switch manufactured by Cutler-Hammer Inc., Milwaukee, provides "fail-safe" performance under either slow or high-speed operating conditions. A typical thrust block installation consists of one final and two slowdown magnetic limit switches for each direction of travel.



Each magnetic limit switch consists of a separately mounted transformer with a U-shaped magnetic circuit through which the actuating plate passes and an electronic control unit mounted on the motor control panel. The ½ to 1-in. thick steel actuating plate traveling through the 3-in. opening in center of transformer de-energizes a control relay causing it to drop out and thus stopping the motor.

Control relay drops out immediately

Always Specify

CLE-FORGE HIGH SPEED DRILLS

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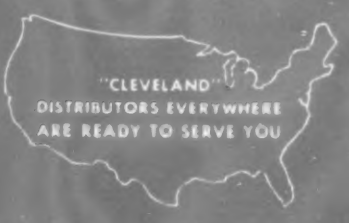

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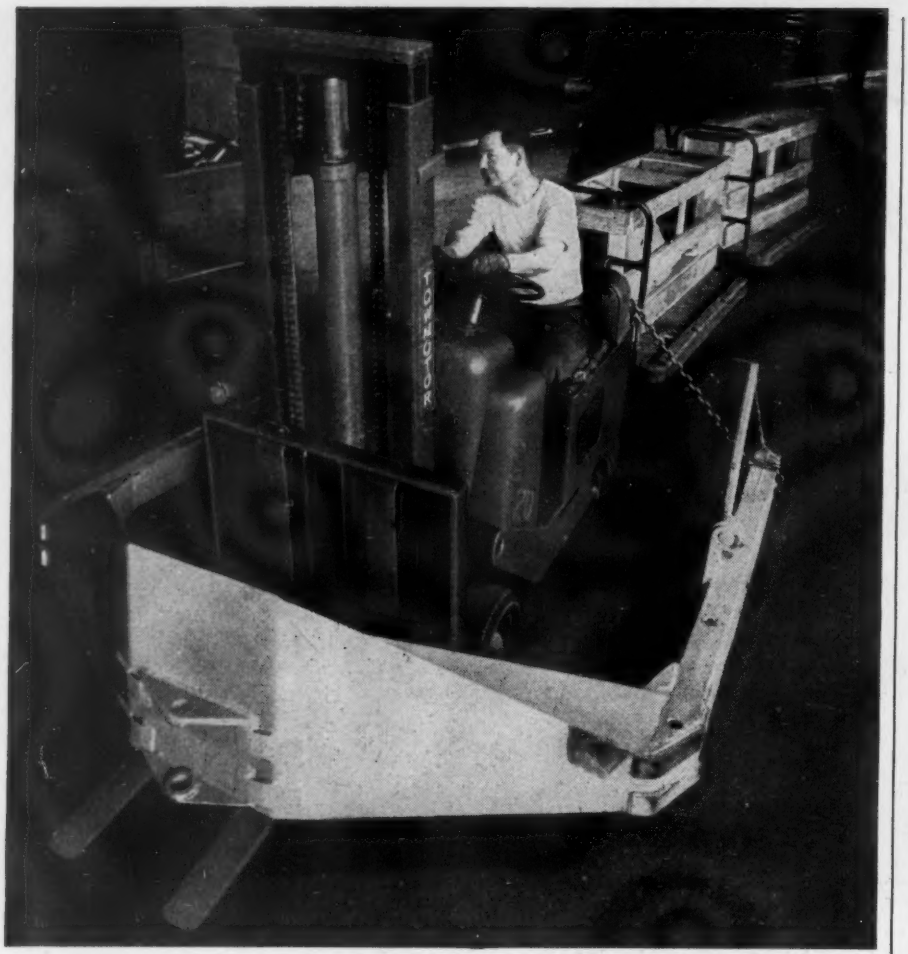


Handling is *HEAVY* at the Crossroads

1900 TONS of LCL freight, ranging from cartons of candy to bulky tombstones, shoot through the Galeswood, Illinois, transfer station of The Chicago, Milwaukee, St. Paul and Pacific Railroad Company every 24 hours. Unloading, classifying, checking and reloading an enormous variety of freight in time to meet scheduled train movements calls for fast, accurate handling . . . the kind that a Towmotor Fork Lift Truck can provide.

Used chiefly to unload and load boxcars, Towmotors also serve as "trouble-shooters" to daily expedite hundreds of other difficult handling operations. Whether it's a load of fragile china or an 1800 lb. road grader yoke, Towmotor handles it quickly, easily and safely, reduces handling time and labor as much as 75%, often triples boxcar capacity through high stacking of cumbersome loads.

Regardless of the type of product you make, candy or tombstones, china or road grader yokes, a Towmotor Fork Lift Truck can increase your production by means of fast and efficient handling in all phases of manufacturing and distribution. What Towmotor has done for The Milwaukee Road, Towmotor can do for you. Send for a copy of the Towmotor Materials Handling ANALYSIS GUIDE. Towmotor Corporation, 1223 E. 152nd Street, Cleveland 10, Ohio.

TAKE IT UP WITH

TOWMOTOR

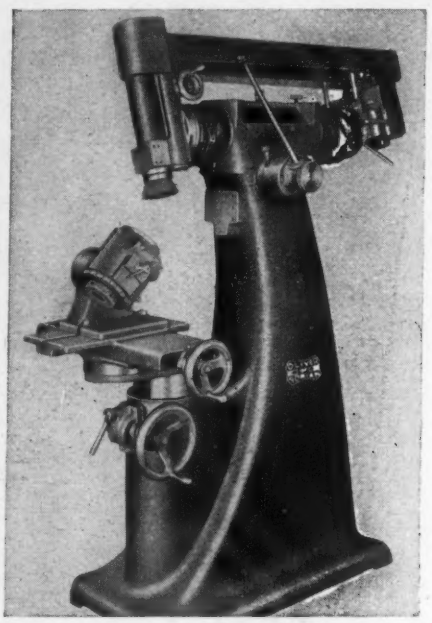
THE ONE-MAN-GANG

to stop the motor with any failure, short circuit or open circuit. Another safety feature provides instant stopping of motor with definite time delay before resettling to assure sufficient time for relatively slower motor control contactors to operate. Limit switch is designed for operation with actuating plate speeds up to 4000 fpm.

Steel 11/18/46; *Item No.* 9779

Tool and Cutter Grinder

A grinder intended for the heavier work of gumming and gashing cutters, and for use in grinding cutters tipped with tungsten carbide this Ace grinder (illustration shown), manufactured by Oliver Instrument Co. of Adrian, Mich., is equipped



with heavy ram, large ram bearing, heavy motor and spindle.

Features include fixed diamond which compensates for wear and wheel and means for grinding eccentric relief on milling cutters and reamers. Correct clearance is obtained by direct reading, and grinding on top tooth of cutter is in full view of operator.

Steel 11/18/46; *Item No.* 9933

High Voltage Starters

Electric Machinery Mfg. Co., Minneapolis, Minn., is manufacturing a new line of Hi-Fuse polarized field frequency synchronous motor controls with current-limiting fuses. These general-purpose, high-voltage combination starters are usually applicable without necessity of engineering analysis of short circuit currents.

Control is a complement to low-voltage combination synchronous motor starters universally used, providing disconnecting means, short-circuit protection, and

Company Community Country

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You're doing everybody a favor—including yourself—by supporting the Payroll Savings Plan.

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If not, or if you wish additional copies, just ask your State Director of the Treasury Department Savings Bonds Division.

The Peacetime Payroll Savings Plan—A booklet, published for key executives by the Treasury Department, containing helpful suggestions on the conduct of your payroll savings plan for U. S. Savings Bonds.

This Time It's For You—A booklet for employees . . . explaining graphically how the payroll savings plan works . . . goals to save for, and how to reach them with Savings Bonds.

The Treasury Department acknowledges with appreciation the publication of this message by

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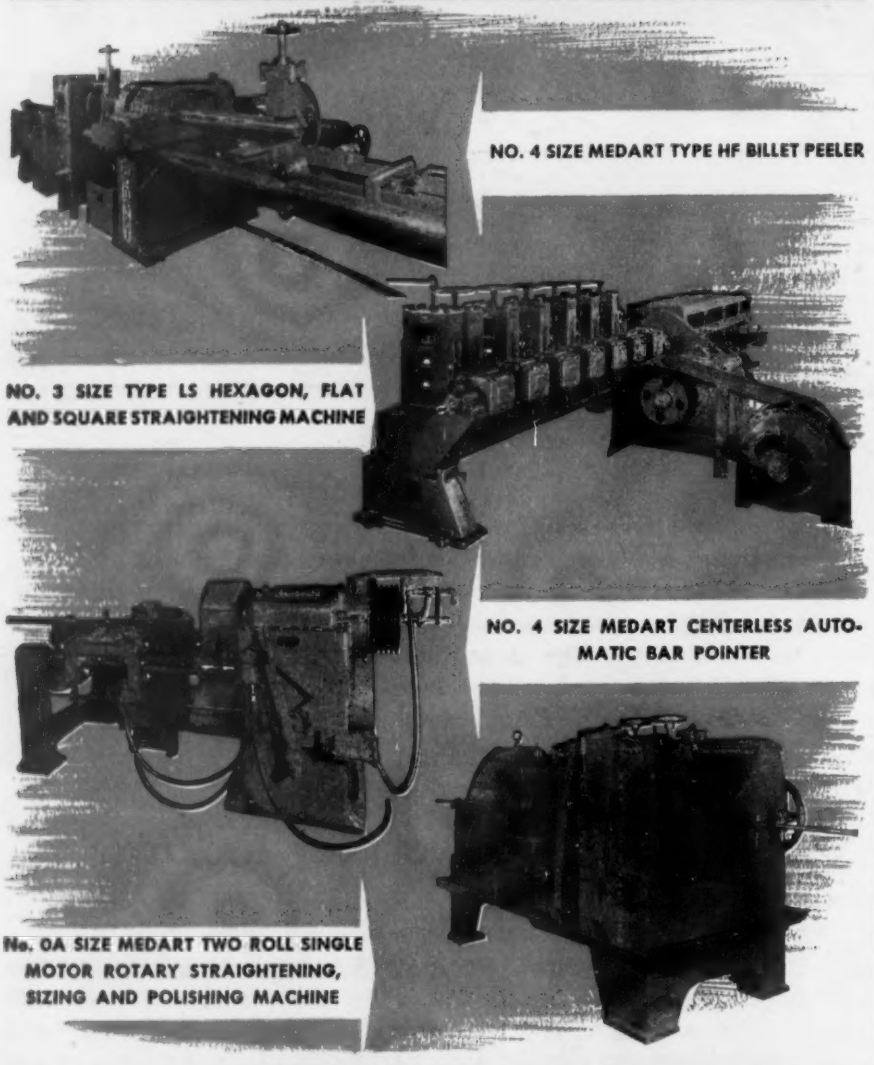
COLD FINISHING MACHINES

Look to Medart . . . because Medart makes every type: Straightening and Turning Machines . . . billet peelers . . . bar centerers . . . bar pointers, etc. Installations throughout the entire metal industry attest their excellence and many long years of service. Medart cold finishing machines are used for working all types of metals.



NO. 4 SIZE MEDART TYPE HF BILLET PEELER

NO. 3 SIZE TYPE LS HEXAGON, FLAT AND SQUARE STRAIGHTENING MACHINE

NO. 4 SIZE MEDART CENTERLESS AUTOMATIC BAR POINTER

No. 0A SIZE MEDART TWO ROLL SINGLE MOTOR ROTARY STRAIGHTENING, SIZING AND POLISHING MACHINE

MANUFACTURING ENGINEERS OF COMPLETE TRANSMISSION EQUIPMENT AND SPECIALIZED MACHINERY

MEDART

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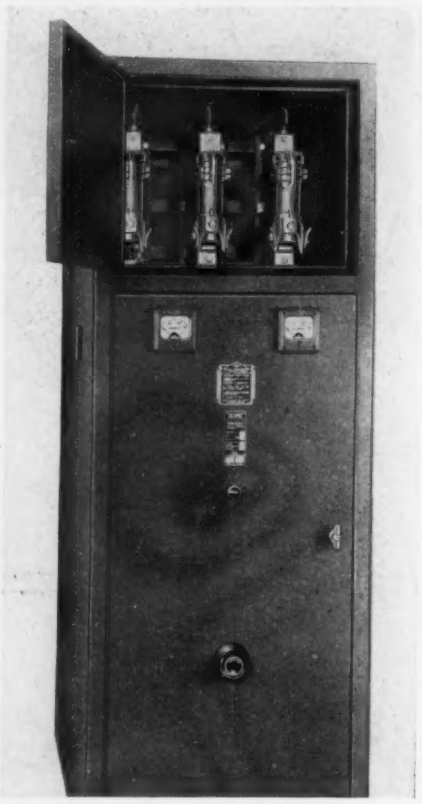
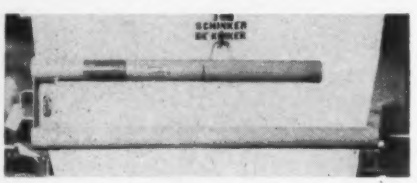
motor overload protection. It is furnished in voltage ratings up to 5000, with a current interrupting capacity of 60,000 amp asymmetrical.

Steel 11/18/46; *Item No.* 9750



Wire Rod and Coil Grab

A fully counterbalanced wire rod and coil strip stock grab is being manufactured by Mansaver Industries Inc., 310 East street, New Haven 3, Conn. Use of pipe for the lifting section reduces the bending effect on a strip or wire.

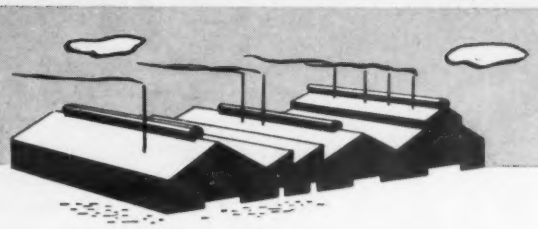


Grabs are made in capacities of from 1000 to 6000 lb. They are made in exact lengths to meet the individual requirements and to conserve space.

Steel 11/18/46; *Item No.* 9765

Shaper

Production of a 7-in. shaper is announced by Logan Engineering Co., 4901 West Lawrence avenue, Chicago. It is quickly and easily set up to handle a wide variety of work, including straight and angular cuts, squaring, machining and slotting operations. Built entirely of steel and cast iron, with extra weight at vital points, shaper is said to take



Ventilation and Production

There is a vital relationship in your plant between ventilation and production—no matter what your product may be. This is too often ignored or underestimated. Improper ventilation—or lack of ventilation—of your buildings can be very costly in slowing down production and impairing the quality of your product; while *proper* ventilation can lower your costs while stepping up production and maintaining highest quality standards. Where excessive heat, smoke, and fumes are present they must be exhausted from your building *quickly and efficiently*—without "lag"—but building comfort in cold weather should not be impaired.

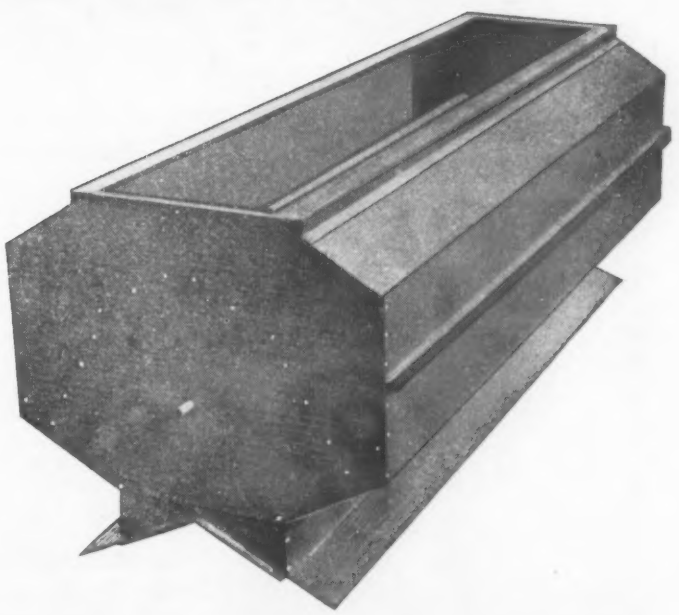
That is why it is to your advantage to have the expert advice of experienced engineers in determining the solution to your ventilation problems; and also why the latest design Industrial Ventilator will prove most advantageous and economical for your buildings.

Plasteel Air Controls combine the advantages of past designs with unique exclusive features heretofore unavailable. They "do the job"—when, where, and as you want it done. There is a design for each specific purpose. Plasteel Engineers are available to apply a wealth of past experience and unusual knowledge of building air movements to your problems. Write, wire, or phone today.

PLASTEEL AIR CONTROLS

Ridge Ventilator

The modern design with exclusive features. Provides highest efficiency with utmost economy. Contains no exhaust retarding braces, baffles, or other framework. Air flow is streamlined and full exhaust is obtained regardless of weather conditions. May be dampered partially or fully with slight pull of damper chain and opened likewise. Made of Plasteel—it's permanent—never needs painting, and it is extremely easy to erect on any type building. Made in sizes to 30 inch throat—other designs to 72 inch throat. Let us show you its exclusive features.



PLASTEEL ROOFING PLASTEEL AIR CONTROL

PROTECTED STEEL PRODUCTS

General Office and Plant • Washington, Pennsylvania

Production Screwdrivers

Speed up

YOUR SCREWDRIVING ASSEMBLIES BY USING THESE MACHINES

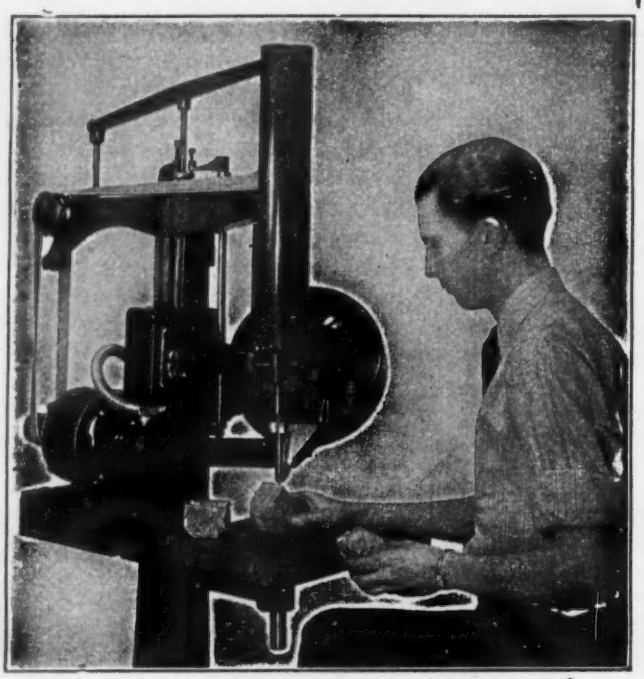
Model B Will Drive Screws from No. 6 to No. 1/4, in Lengths 3/16 to 1½ Inches

•

All Screws Driven to a Uniform Tension

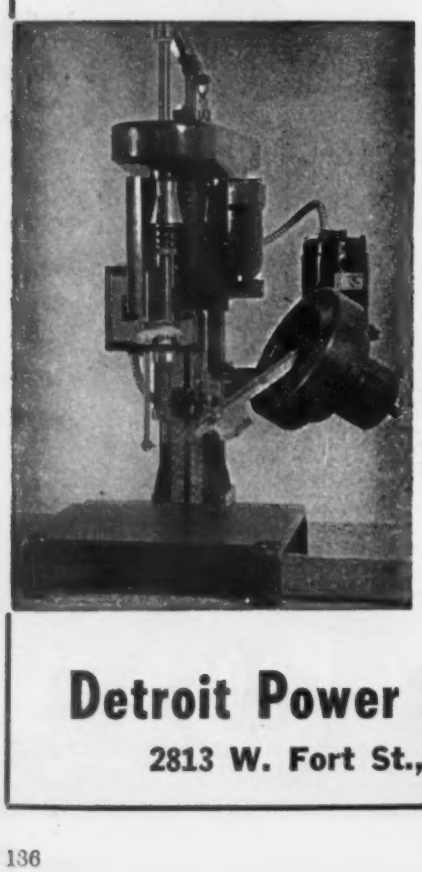
•

No Marring of Heads



MODEL B

MODEL A



Model A Is Designed to Handle Small Screws in Sizes From No. 2 to No. 6 In Lengths From 3/16" to ¾".

•

Driving Time One Second Per Screw

•

Send Sample Assemblies for Production Estimates and Quotations

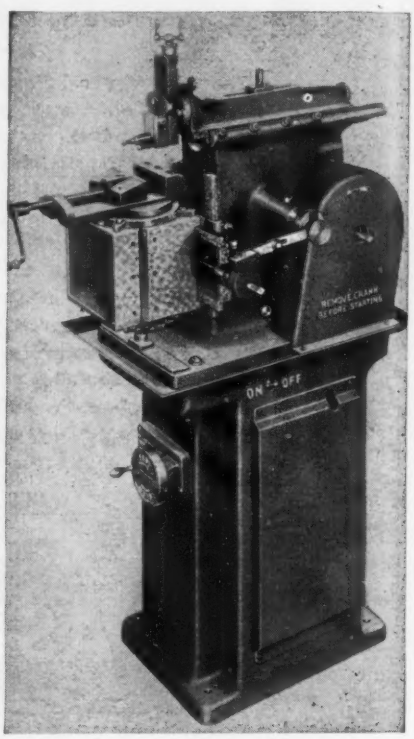
ASK FOR CATALOGUE

Detroit Power Screwdriver Co.

2813 W. Fort St., Detroit 16, Mich.

heavier cuts smoothly, with speed and accuracy, and without chatter.

The shaper has a maximum stroke of 7-⅝-in. and provides any desired operating speed between 64 and 175 strokes per minute. Speed is changed instantly, without stopping the motor or shifting the belt. Included are six automatic feeds in either direction from 0.002 to



0.012-in., with a half turn of feed handle reversing feed. Tool head may be swiveled and instantly reset to center by means of tapered locating pins.

Steel 11/18/46; *Item No.* 9772

Atomizing Nozzle

Large-capacity pneumatic atomizing nozzle is now offered for ½-in. pipe connections by Spraying Systems Co., 4021-R West Lake street, Chicago 24. It provides capacities of 20, 40, or 60 gph.

Built to operate with compressed air although other gases or steam can be used, the nozzle is of internal mixing type. It also may be obtained in each size with or without a shut-off needle.

Steel 11/18/46; *Item No.* 9749

Tubing Carrier

Combination carrier and stowage rack for handling retractable tubing or storing it when not in use, was developed recently by Warner Bros Co., Spiratube Division, Bridgeport 1, Conn.

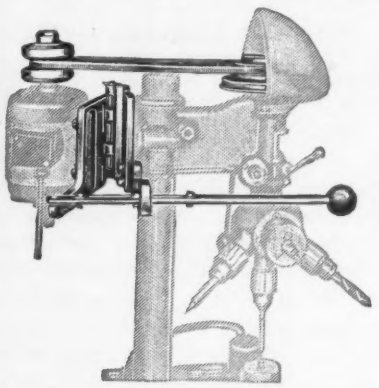
Called "Spira-Tote", carrier comes in various sizes to accommodate various lengths and diameters of Spiratube

flexible tubing made by company. Tubing is easily piled upon rack and locked into position. Hinged extension pieces at top of rack turn to permit tubing to slip onto the rack, then move out, locking it in place.

Steel 11/18/46; *Item No.* 9743

Speed Changer

Chicago Drillet Corp., 1729 North Winchester avenue, Chicago 22, announces a speed changer for controlling drilling and tapping speeds on all drill presses without changing belts or stop-



ping motor. It can be set for any range of speeds desired, using all steps of a V-belt pulley. The speed changer can be installed on any make of drill press in a few minutes without making any alterations.

Steel 11/18/46; *Item No.* 9761

X-Ray Photometer

X-ray photometer which indicates and records the concentration of one chemical element in presence of others in solids, liquids or gases is announced by General Electric Co., Schenectady, N. Y. The instrument, which is nondestructive to most materials, accomplishes this by measuring change in absorption of x-rays between a sample and a standard.

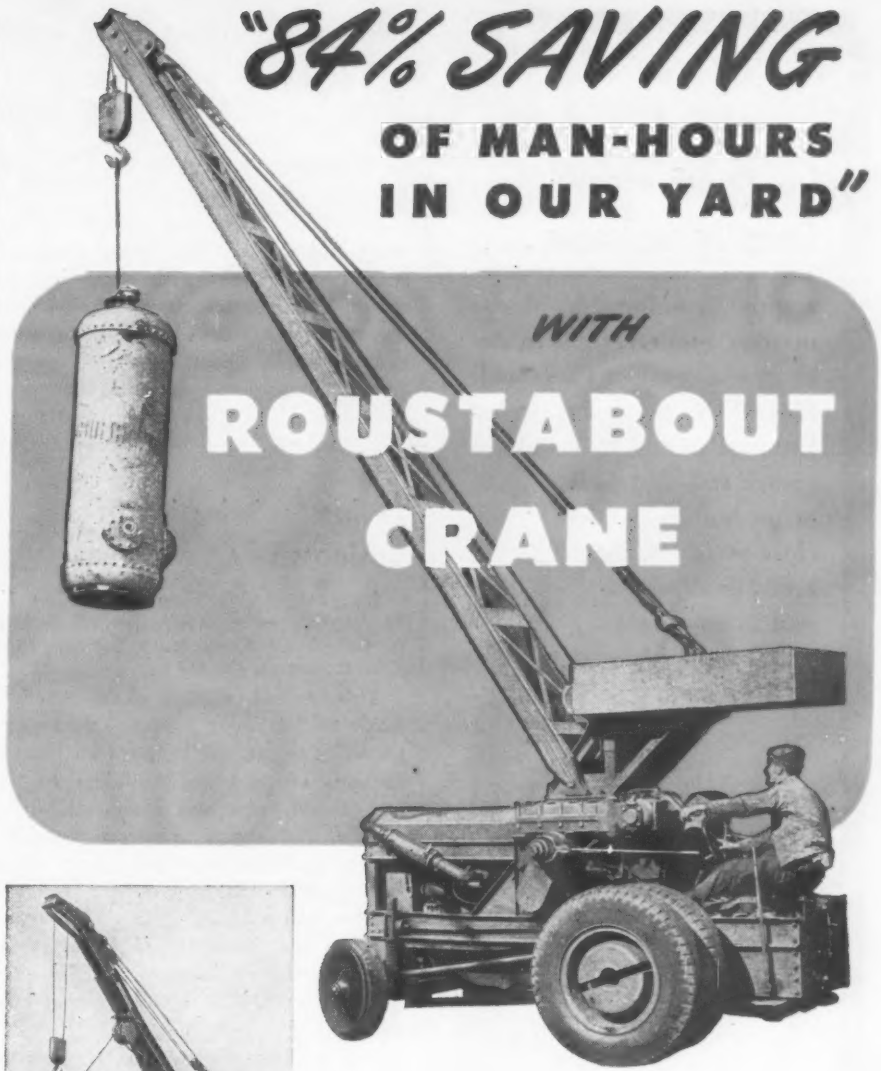
It can be used in such applications as determining ash content of coal, sulphur content of oil, hydrocarbon, chlorine or fluorine content of plastic, tetrethyl lead content of gasoline, and bromine concentration in certain brominated compounds. Sensitivity of this method of analysis varies from 0.01 per cent to 1.00 per cent, depending upon the difference in atomic numbers of components making up specimens.

Photometer is housed in a standard control cabinet, 72 in. high, 28 in. wide, and 20 in. deep. Equipment incorporates a standard x-ray industrial generator which with tube in oil-immersed. Tube has a beryllium window and a tungsten target, and is water-cooled.

Steel 11/18/46; *Item No.* 9601

"84% SAVING OF MAN-HOURS IN OUR YARD"

WITH ROUSTABOUT CRANE



● With magnet, Roustabout handles large or small castings.

● With grab-bucket Roustabout hustles sand, cinders, etc.

● "Man-hours reduced to 1/7 of former needs." "75% reduction in man-hours." "Saves about 60% on man-hours." "60 to 80% saving in time and man-hours." These are common reports from Roustabout users who mechanize their yards with this mobile load-hustler that goes *where* you want it *when* you want it, keeps things moving, prevents costly delays. Modernly built for years of overwork, loads to 7½ tons. Write now for facts about this profitable Roustabout hundreds of plants wouldn't be without!

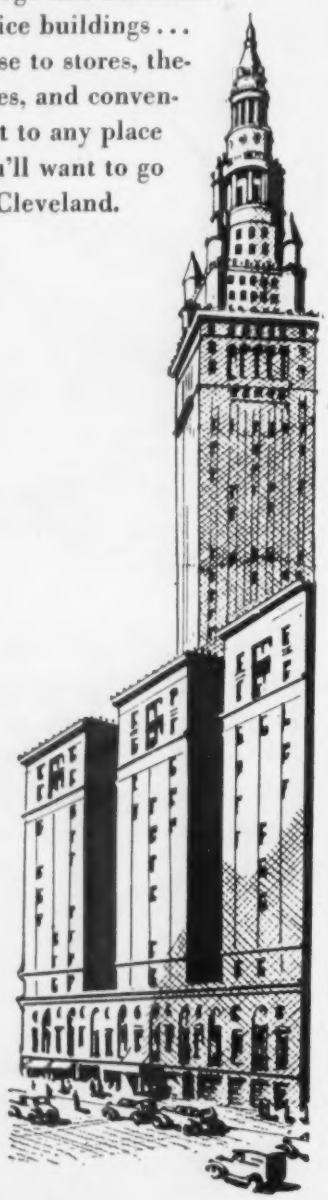
THE HUGHES-KEENAN COMPANY
585 NEWMAN STREET • MANSFIELD, OHIO

ROUSTABOUT CRANE

Roustabout Cranes
By Hughes-Keenan
Load-Handling Specialists Since 1904

A warm and friendly welcome . . .

a quiet, comfortable, sleep-inviting room . . . right in the heart of downtown Cleveland. Hotel Cleveland adjoins Union Passenger Terminal, garage and Terminal office buildings . . . close to stores, theatres, and convenient to any place you'll want to go in Cleveland.



HOTEL CLEVELAND

Cleveland, Ohio

Quenching Tanks

(*Concluded from Page 98*)

skid boxes and are conveyed by power truck after blanking from strip steel to the heat treating department. Here they are removed from the boxes and placed in the ovens, later being replaced in the boxes and trucked to finishing machines with comparatively little time lost in transit. The same advantage is found with use of power trucks in working with molten metals. Quick moving conserves heat, as illustrated by skid mounted ladles, of which there are several types in general use.

Guide to Selection of Business of One's Own

Business of My Own, By Arthur E. Morgan; paper, 184 pages, 6 x 9 inches; published by Community Service Inc., Yellow Springs, O., for $1.

This second edition of a practical guide to the young man seeking an opportunity to get into business for himself includes changes and additions to the text, a full index and additional bibliography. The aim is to suggest possibilities, with illustrations, and by discussing the general aims to be achieved in independent business. The aim has been to open up the world of opportunities for independent business, not to give detailed instructions for conducting business.

Coming from the pen of Dr. Morgan, whose work at Antioch College at Yellow Springs and later as head of the Tennessee Valley Authority is known the world over, it is authoritative and possesses the highest value as a guide.

Lincoln Tells Philosophy Of His Incentive Plan

Lincoln's Incentive System, by James F. Lincoln; cloth, 192 pages, 5¾ x 8¾ inches; published by McGraw-Hill Book Co., New York, for $2.

This book by the president of Lincoln Electric Co., Cleveland, is an exposition of the philosophy behind the incentive management plan of the company which has resulted in an increase of output per man per year of more than 12 times.

The author in presenting the plan for the first time gives data to show that the success in his company may be obtained by application of the plan universally in all activities requiring cooperative action by a number of people. The text illustrates step by step the details of its practical use.

"Incentive management, as outlined in this book, goes far beyond the usual conceptions of incentive pay. Incentive management is presented as a philosophy of industry and life, which starts with the needs of society and depends primarily for its success on the development in the individual of his latent abilities. It is not only a method of wage payment; it is an economic system," says Mr. Lincoln in his preface.

To those expecting a formula for successful application of the plan the author replies that fundamental philosophy cannot be stated in a rule. Principles only can be stated and results shown.

Handbook of Ammunition As Used in Modern War

Elements of Ammunition, by Theodore C. Ohart; fabrikoid, 412 pages, 6 x 9 inches; published by John Wiley & Sons Inc., New York, for $6.

This volume is an effort by the author to reduce to writing his technical ammunition experience from 1940 to 1945, to make available in one volume a book which the future beginner in ammunition design and development work can use in his effort to become oriented in an interesting and complex field.

Three varieties of ammunition are considered: The conventional older types in existence during World War I, of which small-arms and artillery ammunition are samples; types developed between World Wars I and II, such as aircraft ammunition, improved types of small-arms and artillery ammunition and pyrotechnics; types developed primarily during World War II, such as rockets and many new varieties of all types.

The volume is rich in illustrations and tables and a complete index aids in finding the subject desired.

Metallurgy for Laymen

Metallurgy, third edition; cloth, 418 pages, 5½ x 8¼ in.; published by American Technical Society, Chicago, for $5.

The author, Carl G. Johnson, is assistant professor of mechanical engineering at Worcester Polytechnic Institute. The third edition continues the purpose of the first, to present information on the subject of metals so that the average individual who has had no opportunity to study the subject formally can obtain some working knowledge of the manufacture and behavior of metals and alloys. Revision was with the idea of improving the presentation and including additional material. Information has been added on bearing alloys, aluminum alloys, copper and copper alloys, alloy steels, cast iron and heat treatments.

Each chapter is followed by quiz questions as a means of self-help to the student, and serve as a teaching aid in class.

Infrared Degreasing

(*Concluded from Page* 104)

The two infrared ovens at Barcalo were manufactured and installed by Fostoria Pressed Steel Corp., Fostoria, O. Employing two different types of infrared equipment, they illustrate the use of both reflector lamp and clear lamp used in conjunction with a special reflector. The degreasing oven employs eight hundred thirty two 375 w reflector type lamps backed up by flat reflecting surfaces plated with gold to gain maximum efficiency from the energy. The paint baking oven is made up of special gold reflectors and uses 375 w lamps near the oven entrance to heat frames quickly, and 250 w lamps for rest of the oven.

Cleaning Engine Component

(*Concluded from Page* 108)

positioned so that the dirt would spill out. This was particularly true in the case of motor heads and motor blocks, which have recesses and channels where dirt could hide unnoticed. Also, it was easy to miss a spot in the drying process, and rust would form where moisture remained on the part.

Now in operation are three automatic washing machines, one for heads, another for blocks, and the third for smaller and less complicated parts of the motor that is to be cleaned.

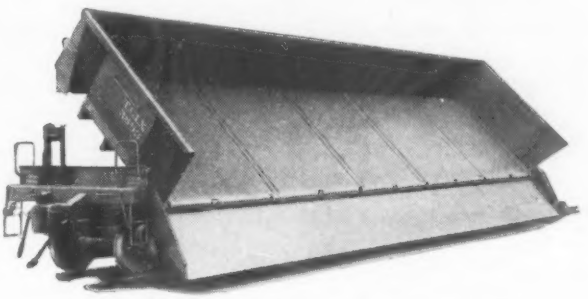
Three Stages of Washing

In the head washer, motor heads move in on a roller conveyor, are locked into place on an endless chain, and go through three stages of washing. The first operation consists of thoroughly bathing the cylinder heads in a solution to dissolve oil or grease. The solution is projected at the cylinder head from a revolving cylindrical rotor containing a slot lengthwise from which the cleaning mixture is thrown by centrifugal force. The second stage consists of passing the head through the same type of washing action, but clear hot water containing a small amount of rust inhibitor is substituted for the solution used to dissolve grease. This produces a head that is free of dirt. Heat from the preceding operations plus an air blow-off at the end of the washer produces a clean, dry cylinder head.

During the process the heads are turning—they revolve 32 times in all—so that cleaning water, rinse and air reach all crevices. Blocks go through the same process on conveyor cradles, but instead of turning, they are rocked from side to side. Smaller parts are washed on conveyor hooks, the parts being placed and slanted so as to come into full contact with the water and air during the process.

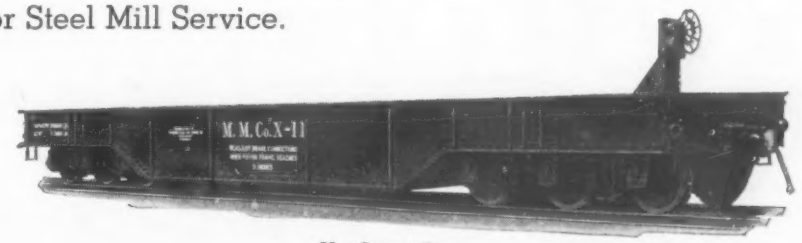
Steelcar ★ ★ ★ ★

FOR GREATER HAULAGE DEPENDABILITY FOR STEEL PRODUCERS

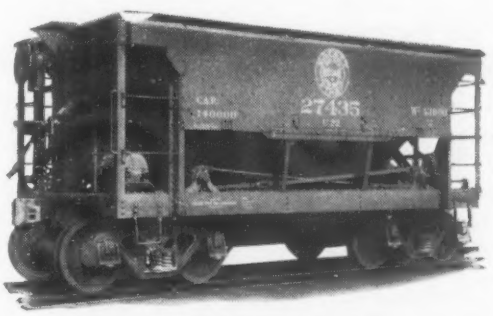


Rolling Trunnion Automatic Air Dump Car

This company designs and builds a wide range of cars for steel-making plants, including: • Automatic Air Dump Cars • Gondola Cars • Hot Bloom Cars • Open Hearth Pit Scrap Cars—High and Low Side Types • Flat Cars • Ingot Cars • Hot Ingot Cars • Cinder Pot Cars • Billet Cars • Ingot Trailer Trucks • Charging Cars • Coil Handling Cars • Tube Transfer Cars • Annealing Furnace Cars • Trackless Equipment for Steel Mill Service.



Hot Ingot Car



Hopper Discharge Ore Car

Write for descriptive, technical Bulletin 72E— "Cars for Steel Plant Service."

PRESSED STEEL CAR COMPANY, INC.
PITTSBURGH 19, PA.
NEW YORK .... CHICAGO .... ST. LOUIS .... ST. PAUL

The Business Trend

Production Rate Holds At Postwar High Mark

INDUSTRIAL ACTIVITY continued at a high rate in the week ended Nov. 9, with the result that STEEL's industrial production index remained at the postwar high mark of 157 per cent set in the preceding week.

PRICES—Discarding of price controls has brought forth much speculation as to how rapidly and to what extent production, especially of items currently scarce, will be facilitated. The Federal Reserve Bank of Cleveland said removal of price controls can be expected to be followed by a period of erratic price movements as markets seek to establish supply-demand relationships. In many cases where controls have been removed, prices have first increased sharply and then have reacted somewhat, and in some cases have declined from previously existing levels, the bank pointed out. During the week when price controls were lifted from meats the Bureau of Labor Statistics index of wholesale prices for all commodities jumped from 126.0 per cent of the 1926 average of 100 to 135.1 per cent. In the next week the index rose but slightly to 135.9 per cent, and in the following week (week ended Nov. 2) dropped to 134.8 per cent, largely because of lower prices for agricultural commodities.

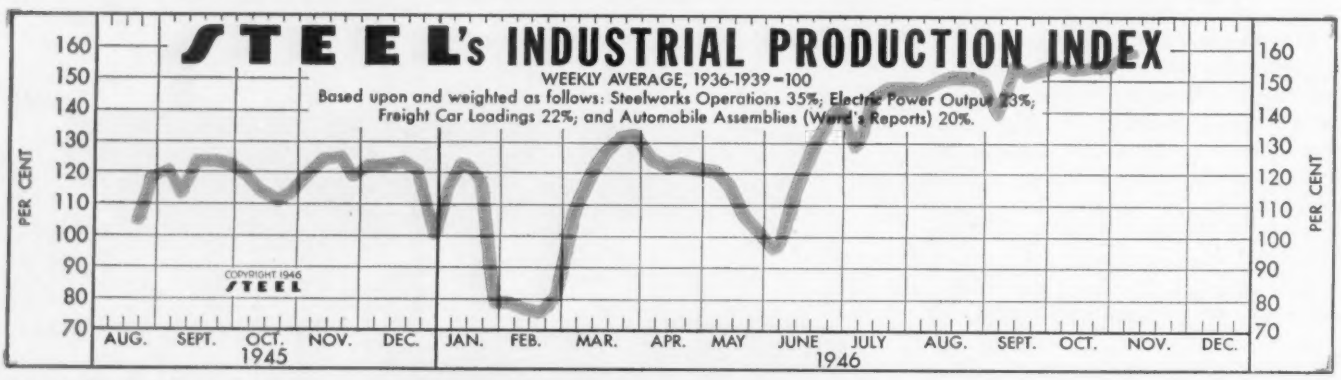
AUTOS—While automobile output declined in the week ended Nov. 9 to 92,490 passenger cars, trucks and busses, it was still higher than in any postwar week except that ended Nov. 2 when 95,427 units were produced.

STEEL—The steel industry, heavily laden with orders, continues ingot production at a high rate, production for the week ended Nov. 9 being at 91.5 per cent of capacity, a new postwar high.

COAL—Also at a high level has been bituminous coal production, but whether this high rate can continue the rest of the year depends to a great extent on the outcome of negotiations through which the United Mine Workers seek a new contract. In the week ended Nov. 2, coal output was estimated at 12,390,000 tons, bringing total production thus far this year to 451,266,000 tons, only 6.8 per cent behind output for the corresponding period of 1945.

EMPLOYMENT—Continually rising industrial production has boosted factory employment, with each month since February showing a gain. From the year's low point of 12,536,000 in February, factory employment had risen to 14,707,000 in September. With complaints heard frequently that employee productivity is lower than it should be, some of the increase in total employment undoubtedly comes from a need for more employees than would otherwise be necessary.

FREIGHT CARS—Although railroads are experiencing a serious shortage of freight cars they received only 3828 new ones in October, compared with 4016 in September. Lack of sufficient supplies of steel, along with effects of strikes in many small plants which provide supply items, caused both the car building industry and railroad shops to fall behind freight car production schedules.



The Index (see chart above): Latest Week (preliminary) 157 Previous Week 157 Month Ago 153

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)‡	91.5	91	90	76
Electric Power Distributed (million kilowatt hours)	4,629†	4,628	4,495	3,948
Bituminous Coal Production (daily av.—1000 tons)	2,065	2,077	2,020	2,081
Petroleum Production (daily av.—1000 bbls.)	4,779	4,759	4,737	4,451
Construction Volume (ENR—Unit $1,000,000)	$53.6	$109.4	$81.9	$45.8
Automobile and Truck Output (Ward's—number units)	92,490	95,427	86,330	32,225

* Dates on request. ‡ 1946 weekly capacity is 1,762,381 net tons. 1945 weekly capacity was 1,831,636 net tons. † Preliminary.

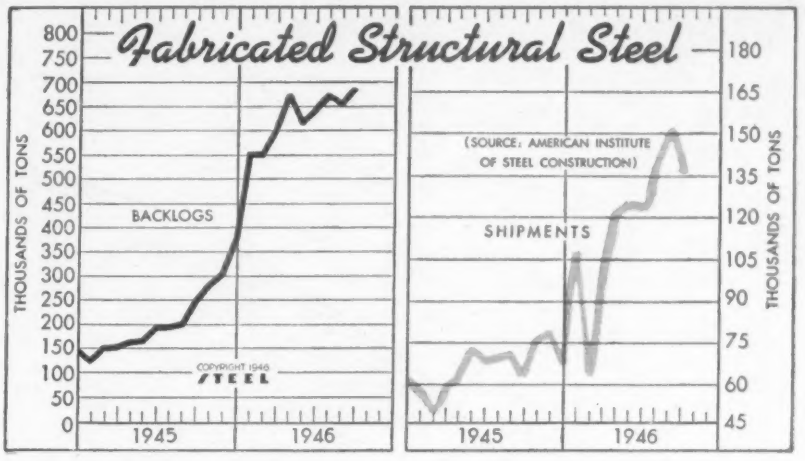
TRADE				
Freight Carloadings (unit—1000 cars)	928†	922	899	838
Business Failures (Dun & Bradstreet, number)	25	22	25	17
Money in Circulation (in millions of dollars)‡	$28,750	$28,588	$28,608	$28,137
Department Store Sales (change from like week a year ago)‡	+17%	+23%	+15%	+10%

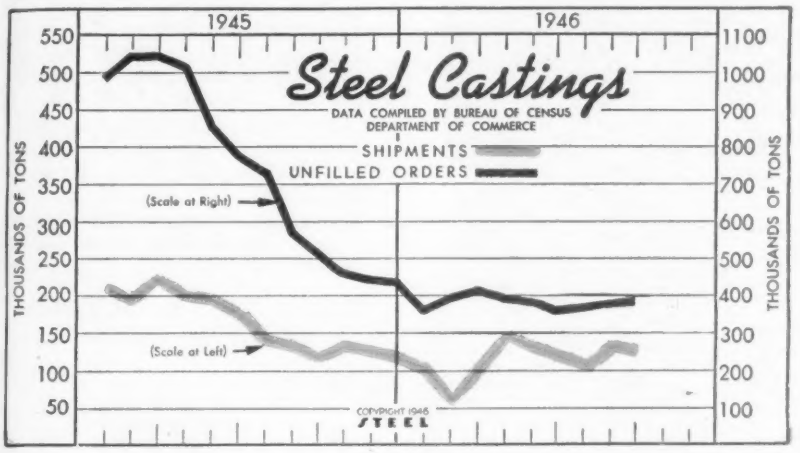
† Preliminary. ‡ Federal Reserve Board.

Fabricated Structural Steel

(000 Tons)

	Shipments			Backlogs		
	1946	1945	1944	1946	1945	1944
Jan.	107.5	57.0	35.2	552	124.4	113.1
Feb.	63.8	49.0	42.9	551	151.6	117.6
Mar.	102.8	59.5	41.4	605	153.3	106.3
Apr.	122.5	62 8	44.5	674	162.5	111.2
May	124.4	72.6	50.7	615	165.7	116.3
June	126.8	69.2	43.0	642	195.2	122.7
July	136.4	69.9	45.3	674	194.0	125.4
Aug.	152.9	70.6	55.2	651	201.1	130.4
Sept.	135.8	63.4	57.5	682	248.5	151.1
Oct.	....	76.6	61.6	...	282.8	174.4
Nov.	....	78.0	59.4	...	304.9	184.2
Dec.	....	68.8	61.3	...	375.2	142.5
Total	....	797.4	597.9	...	....	....





Commercial Steel Castings

(Net tons in thousands)

	Shipments		Unfilled Orders*	
	1946	1945	1946	1945
Jan.	99.1	210.2	358.9	983.1
Feb.	57.4	191.4	390.1	1,045.4
Mar.	101.4	222.6	412.3	1,047.7
Apr.	146.3	197.7	392.8	1,018.9
May	129.2	192.9	381.7	852.9
June	123.6	173.7	361.3	776.3
July	119.2	139.3	362.6	728.4
Aug.	130.4	131.4	374.7	565.6
Sept.	126.4	114.6	384.0	513.8
Oct.	....	130.3	....	460.3
Nov.	....	123.0	....	443.8
Dec.	....	115.2	....	434.3

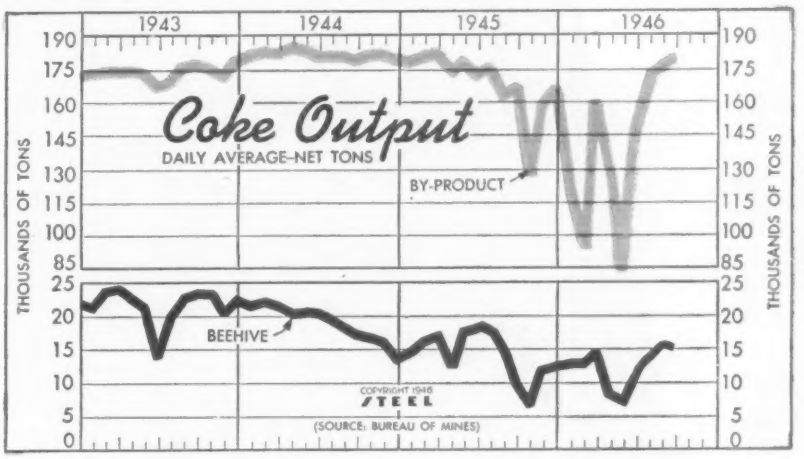
*Castings for sale.

Coke Output

Bureau of Mines

(Daily Average—Net Tons)

	By-Product		Beehive	
	1946	1945	1946	1945
Jan.	122,570	179,879	13,069	14,745
Feb.	93,085	180,727	13,064	16,210
Mar.	161,290	182,120	14,897	17,115
Apr.	128,394	174,239	811	12,554
May	83,019	178,338	708	17,963
June	147,272	172,201	12,193	18,616
July	171,703	175,163	14,831	17,682
Aug.	176,195	163,567	16,317	14,669
Sept.	178,250	166,559	15,584	9,924
Oct.	.....	127,173	.....	6,407
Nov.	.....	159,646	.....	12,218
Dec.	.....	166,648	.....	12,659
Ave.	.....	168,855	.....	14,230



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$11,888	$11,534	$11,862	$10,326
Federal Gross Debt (billions)	$261.9	$263.8	$263.7	$262.8
Bond Volume, NYSE (millions)	$22.6	$30.3	$27.6	$32.4
Stocks Sales, NYSE (thousands)	6,360	8,224	7,911	8,949
Loans and Investments (billions)†	$58.6	$58.8	$58.1	$60.9
United States Government Obligations Held (millions)†	$39,044	$39,619	$39,088	$45,142

† Member banks, Federal Reserve System.

PRICES

	Latest Period*	Prior Week	Month Ago	Year Ago
STEEL's composite finished steel price average	$64.45	$64.45	$64.45	$58.27
All Commodities†	134.8	135.9	125.1	105.9
Industrial Raw Materials†	150.9	153.0	144.5	118.2
Manufactured Products†	130.4	131.7	118.1	101.9

† Bureau of Labor Statistics Index, 1926=100.

ERIE *Self-contained*
Board Drop
HAMMERS

("V" Belt Drive or Geared Head Types)

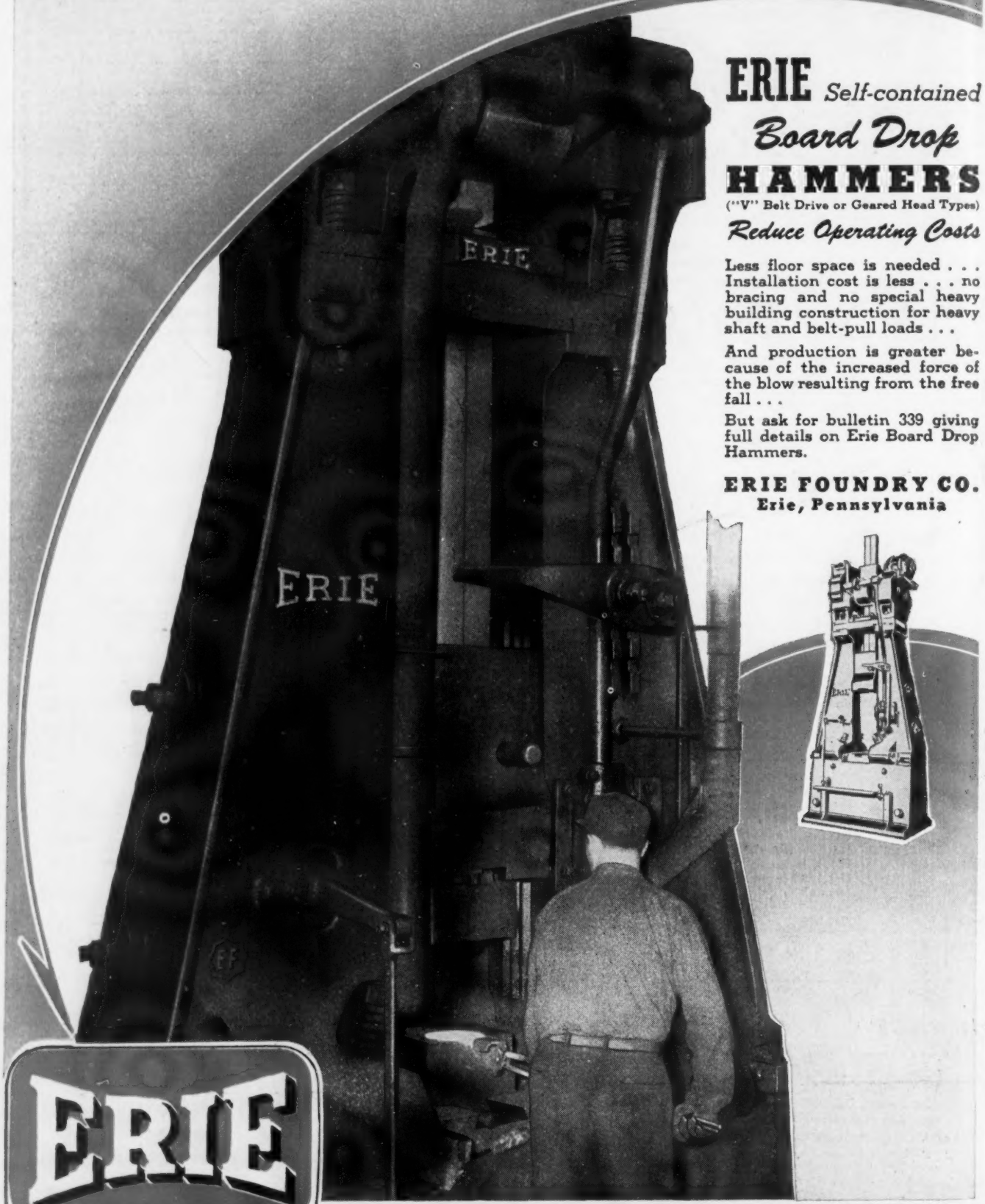
Reduce Operating Costs

Less floor space is needed . . . Installation cost is less . . . no bracing and no special heavy building construction for heavy shaft and belt-pull loads . . .

And production is greater because of the increased force of the blow resulting from the free fall . . .

But ask for bulletin 339 giving full details on Erie Board Drop Hammers.

ERIE FOUNDRY CO.
Erie, Pennsylvania



ERIE

ERIE BUILDS *Dependable* HAMMERS

Scrap and Nonferrous Metal Prices Advance

Finished steel prices unchanged . . . Increases in scrap range up to $5 in steelmaking grades. . .Copper, lead, zinc and tin move substantially higher

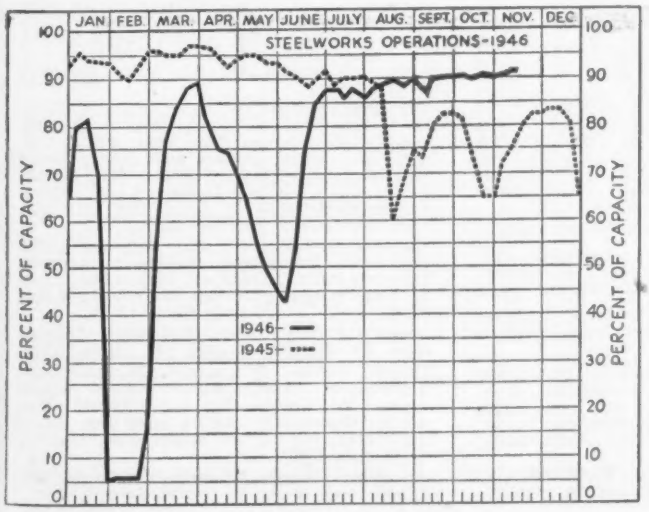
ADVANCES in iron and steel scrap and major nonferrous metal prices featured the first week of decontrol. Finished steel prices held unchanged but increases on certain products, which have been regarded as underpriced for a long time, may be announced soon. This action will be selective, at least that is the present prospect.

What the more distant future holds will depend largely upon the trend in labor costs and in prices of raw materials, notably coal, scrap and pig iron. Hence, the outcome of the soft coal negotiations is being watched with special interest.

Scrap is buoyant, but it is still too early to gage the full extent of the advance. To date, melting steel has advanced in leading consuming districts $5 a ton above the OPA levels prevailing at time of decontrol. Although in practical effect, the increase amounts to about $2.50 a ton because of the upgrading which had prevailed. Cast grades advanced irregularly with rises of $15 a ton or more reported in some instances.

With winter approaching and with consumers' inventories small, strength in scrap should continue through to spring, but how high prices will go before they begin to level off and how soon they will begin to become stabilized remain uncertain.

Scrap sellers at present are reluctant to commit themselves on much tonnage because of the possibility of still higher prices. Meanwhile, collectors are being stimulated into action by higher prices, but it will require time for them to accumulate tonnages, especially in the face of winter weather. That price incentive could not have come sooner, say last summer when the matter was such an issue, is generally regretted by the trade.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Nov. 16	Change	Same Week 1945	Same Week 1944
Pittsburgh	98	— 0.5	77	93
Chicago	92.5	+ 0.5	86.5	99
Eastern Pa.	77	None	78	95.5
Youngstown	91	None	75	88
Wheeling	89	None	90	91
Cleveland	89	— 4	83	89
Buffalo	88.5	None	86	90.5
Birmingham	99	None	95	90
New England	90	+ 2	81	90
Cincinnati	89	— 4	67	89
St. Louis	68	None	68	75
Detroit	92	+ 6	87	88
Estimated national rate	91.5	None	80.5	96.5

Based on weekly steelmaking capacity of 1,762,381 net tons for 1946; 1,831,636 tons for 1945; 1,791,287 tons for 1944.

There is little prospect of a change in pig iron prices until the coal miners negotiations are settled, if then. In fact there may be no revision as long as the present premium payment plan, designed primarily to assist the housing program, prevails. However, once premiums come to an end under the present government financing, and should there be an increase in fuel costs, which appears probable, then an overall revision of pig iron schedules would seem likely.

Detinning plants advanced the price of grade "A" tin 18 cents a pound to the basis of 70.00c, New York, and this move was followed by the balance of the market. Leading copper producers advanced prices to the basis of 17.50c, delivered Connecticut valley, followed by advances in brass ingot and brass mill product prices. Copper-clad wire prices increased about 6 per cent. Lead rose to the basis of 10.35c, East St. Louis, while zinc advanced to 10.50c, East St. Louis. Aluminum prices held firm.

Steelmaking operations held unchanged last week at a national rate of 91.5 per cent of capacity. Operations rose one-half point at Chicago to 92.5 per cent, 2 points in New England to 90 per cent, and 6 points to 92 per cent at Detroit. Declines of 4 points at Cleveland and Cincinnati to 89 per cent and of one-half point to 98 per cent at Pittsbrugh counteracted the advances. Operations in other districts were unchanged.

Officials of several of the larger integrated steel companies issued statements last week to the effect that they are planning "no general increases in steel prices at this time." However, some of the smaller concerns asserted that the advance on scrap cannot be absorbed because costs were already high before last week's increases.

Average composite price for finished steel held unchanged last week at $64.45 while semifinished steel held at $40.60. Steelmaking pig iron also held unchanged at $27.50 while steelmaking scrap advanced $5 a ton to $24.17.

COMPOSITE MARKET AVERAGES

	Nov. 16	Nov. 9	Nov. 2	One Month Ago Oct., 1946	Three Months Ago Aug., 1946	One Year Ago Nov., 1945	Five Years Ago Nov., 1941
Finished Steel	$64.45	$64.45	$64.45	$64.45	$64.45	$58.27	$56.73
Semifinished Steel	40.60	40.60	40.60	40.60	40.60	37.80	36.00
Steelmaking Pig Iron	27.50	27.50	27.50	27.50	27.50	24.75	23.00
Steelmaking Scrap	24.17	19.17	19.17	19.17	19.17	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. **Semifinished Steel Composite:**—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. **Steelmaking Pig Iron Composite:**—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. **Steelworks Scrap Composite:**—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month. Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Material

	Nov. 16, 1946	Oct., 1946	Aug., 1946	Nov., 1945
Steel bars, Pittsburgh	2.50c	2.50c	2.50c	2.25c
Steel bars, Philadelphia	2.86	2.86	2.86	2.57
Steel bars, Chicago	2.50	2.50	2.50	2.25
Shapes, Pittsburgh	2.35	2.35	2.35	2.10
Shapes, Philadelphia	2.48	2.48	2.48	2.215
Shapes, Chicago	2.35	2.35	2.35	2.10
Plates, Pittsburgh	2.50	2.50	2.50	2.25
Plates, Philadelphia	2.558	2.558	2.558	2.30
Plates, Chicago	2.50	2.50	2.50	2.25
Sheets, hot rolled, Pittsburgh	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Pittsburgh	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Pittsburgh	4.05	4.05	4.05	3.70
Sheets, hot-rolled, Gary	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Gary	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Gary	4.05	4.05	4.05	3.70
Hot-rolled strip, over 6 to 12-in., Pitts.	2.35	2.35	2.35	2.10
Cold-rolled strip, Pittsburgh	3.05	3.05	3.05	2.80
Bright basic, bess. wire, Pittsburgh	3.05	3.05	3.05	2.75
Wire nails, Pittsburgh	3.75	3.75	3.75	2.90
Tin plate, per base box, Pittsburgh	$5.25	$5.25	$5.25	$5.00

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$38.00	$38.00	$38.00	$36.00
Slabs, Pittsburgh, Chicago	39.00	39.00	39.00	36.00
Rerolling billets, Pittsburgh	39.00	39.00	39.00	36.00
Wire rods, No. 5 to ⅜-inch, Pitts	2.30c	2.30c	2.30c	2.15c

Pig Iron

	Nov. 16, 1946	Oct., 1946	Aug., 1946	Nov., 1945
Bessemer del. Pittsburgh	$29.77	$29.77	$29.77	$26.94
Basic, Valley	28.00	28.00	28.00	25.25
Basic, eastern del. Philadelphia	29.93	29.93	29.93	27.09
No. 2 fdry., del. Pgh. N. & S. sides	29.27	29.27	29.27	26.44
No. 2 fdry., del. Philadelphia	30.43	30.43	30.43	27.59
No. 2 foundry, Chicago	28.50	28.50	28.50	25.75
Southern No. 2, Birmingham	24.88	24.88	24.88	22.13
Southern No. 2, del. Cincinnati	28.94	28.94	28.94	26.05
Malleable, Valley	28.50	28.50	28.50	25.75
Malleable, Chicago	28.50	28.50	28.50	25.75
Charcoal, low phos., fob Lyles, Tenn.	33.00	33.00	33.00	33.00
Gray forge, del. McKees Rocks, Pa.	28.61	28.61	28.61	25.80
Ferromanganese, fob cars, Pittsburgh	140.00	140.00	140.00	140.00

Scrap

Heavy melting steel, No. 1, Pittsburgh	$20.00	$20.00	$20.00	$20.00
Heavy melt. steel, No. 2, E. Pa.	18.75	18.75	18.75	18.75
Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	25.00	25.00	20.00	20.00

Coke

Connellsville, furnace ovens	$8.75	$8.75	$8.75	$7.50
Connellsville, foundry ovens	9.50	9.50	9.50	8.25
Chicago, by-product fdry., del.	15.10	15.10	15.10	13.75

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight. Pricing on rails was changed to net ton basis as of Feb. 15, 1946.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, $33, fob mill; forging quality, $38, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, Coatesville, uncrop, $48.69.

Rerolling, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $39; Detroit, del., $41.50; Duluth (billets), $41; Pac. ports (billets), $51.50 (Andrews Steel Co., carbon slabs, $41; Northwestern Steel & Wire Co., $41, Sterling, Ill.)

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $47; Detroit, del., $49.50; Duluth, billets, $49; forging billets fob Pac. ports, $59.50.

(Andrews Steel Co., carbon forging billets, $50 gross ton at established basing points.)

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $58.43; del. Detroit $60.93; eastern Mich. $61.93.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $38. (Empire Sheet & Tin Plate Co., Mansfield, O., carbon, sheet bars, $39, fob mill.)

Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb, 2.05c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—⅜ in. inclusive, per 100 lb, $2.30. Do., over ⅜—$\frac{17}{32}$-in., incl., $2.45; Galveston, base, $2.40 and $2.55, respectively. Worcester add $0.10; Pacific ports $0.535. Pittsburgh Steel Co., No. 5-9/32 in., $2.65; over 9/32 in., $3.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham base, 20 tons one size, 2.50c; Duluth, base, 2.60c; Detroit, del., 2.635c; eastern Mich., 2.685c; New York, del., 2.86c; Phila., del., 2.86c; Gulf ports, dock, 2.885c; Pac. ports, dock, 3.185c (Josiyn Mfg. & Supply Co., 2.55c, fob Chicago.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.921c; Detroit, del., 3.056c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300	$0.108	4300	$1.839
2300	1.839	4600	1.298
2500	2.759	4800	2.326
3000	0.541	5100	0.379
3100	0.920	5130 or 5152	0.494
3200	1.461	6120 or 6152	1.028
3400	3.462	6145 or 6150	1.298
4000	0.487	8612	0.703
4100 (.15-.25 Mo)	0.737	8720	0.757
(.20-.30 Mo)	0.812	9830	1.407

* Add 0.25 for acid open-hearth; 0.50 electric.

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.10c; Detroit, 3.15c; Toledo, 3.25c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 3.625c; Detroit, del., 3.76c; eastern Mich., 3.79c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.35c; Detroit, del., 2.485c; eastern Mich. and Toledo, 2.535c; Gulf ports, dock, 2.735c; Pacific ports, dock 2.785c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.35c; Detroit, del., 2.485c; eastern Mich. and Toledo, del., 2.535c; Gulf ports, dock, 2.735c.

Iron Bars: Single refined, Pitts., 4.76c; double refined, 5.84c; Pittsburgh, staybolt, 6.22c; Terre Haute, single ref., 5.42c; double ref., 6.76c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base, 2.425c; Granite City, base, 2.525c; Detroit, del., 2.56c; eastern Mich., del., 2.61c; Phila., del., 2.615c; New York, del., 2.685c; Pacific ports, 3.01c. (Andrews Steel Co. quotes hot-rolled sheets for shipment to the Detroit area on the Middletown, O., base; Alan Wood Steel Co., Conshohocken, Pa., 3.00c on hot carbon sheets, Sparrows Point, Md.; Granite City Steel Co., 2.875c, fob Granite City, Ill., 2.775c, fob Gary or Birmingham.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.275c; Granite City, base, 3.375c; Detroit, del., 3.41c; eastern Mich., del., 3.46c; New York, del., 3.615c; Phila., del., 3.635c; Phila., del., 4.24c; Pacific ports, 4.635c. (Granite City Steel Co., 4.50c, fob Granite City, Ill., 4.40c, fob Gary or Birmingham.)

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 4.05c; Granite City, base, 4.15c; New York, del., 4.31c; Phila., del., 4.24c; Pacific ports, 4.635c.

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29-gage, per square, 3.73c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16-gage not corrugated, copper alloy, 4.15c; Granite City, 4.25c; Pacific ports, 4.635c; copper iron, 4.50c; pure iron, 4.50c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh, 4.60c.

Aluminized Sheets, 20 gage: Pittsburgh, hot-dipped, coils or cut to lengths 9.00c.

Enameling Sheets: 10-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.20c; Granite City, base 3.30c; Detroit, del., 3.335c; eastern Mich., 3.385c; Pacific ports, 3.885c; 20-gage: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.80c; Detroit, del., 3.935c; eastern Mich., 3.985c; Pacific ports, 4.485c.

Electrical Sheets No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.90c	4.685c	4.00c
Armature	4.25c	5.035c	4.35c
Electrical	4.75c	5.535c	4.85c
Motor	5.425c	6.21c	5.525c
Dynamo	6.125c	6.91c	6.225c
Transformer			
72	6.625c	7.41c	....
65	7.625c	8.41c	....
58	8.125c	8.91c	....
52	8.925c	9.71c	....

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, 6-in. and narrower: Base, 2.45c; Detroit, del., 2.585c; eastern Mich., del., 2.635c; Pacific ports, 3.135c. (Superior Steel Corp., 3.30c, Pitts.)

Over 6-in.: Base, 2.35c; Detroit, del., 2.485c; eastern Mich., del., 2.535c; Pacific ports, 3.035c. (Superior Steel Corp., 3.20c, Pitts.)

Cold-Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less, 3.05c; Chicago, base, 3.15c; Detroit, del., 3.185c; eastern Mich., del., 3.235c; Worcester, base, 3.25c. (Superior Steel Corp., 4.70c, Pitts.)

Cold-Finished Spring Steel: Pittsburgh, Cleveland base, 0.26-0.50 carbon, 3.03c. Add 0.20c for Worcester.

Tin, Terne Plate

(OPA ceiling prices announced March 1, 1946.)

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb base box, $5.25; Granite City, Birmingham, Sparrows Point, $5.35.

Electrolytic Tin Plate: Pittsburgh, Gary, 100-lb base box 0.25 lb tin, $4.60; 0.50 lb tin, $4.75; 0.75 lb tin, $4.90; Granite City, Birmingham, Sparrows Point, $4.70, $4.85, $5.00, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29-gage and lighter, 3.30c; Granite City, Birmingham, Sparrows Point, 3.40c; Pacific ports, boxed 4.335c.

Long Ternes: Pittsburgh, Chicago, Gary, No. 24 unassorted, 4.05c; Pacific ports, 4.835c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-base box, $4.55; Granite City, Birmingham, Sparrows Point, $4.65.

Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I. C. 8-lb $12.50; 15-lb $14.50; 20-lb $15.50 (nom.); 40-lb $20.00 (nom.).

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.50c; Geneva, Utah, 2.65c; New York, del., 2.71c; Phila., del., 2.558c; St. Louis, del., 2.74c; Boston, del., 2.86c; Pacific ports, 3.085c; Gulf ports, 2.885c.

(Granite City Steel Co., carbon plates, 2.65c fob Chicago or Birmingham, Central Iron & Steel Co., Harrisburg, Pa., 2.80c, basing points; Lukens Steel Co., Coatesville, Pa., 2.75c, base; Worth Steel Co., Claymont, Del., 2.75c, base; Alan Wood Steel Co., Conshohocken, Pa., 2.75c base.)

Floor Plates: Pittsburgh, Chicago, 3.75c; Pacific ports, 4.435c; Gulf ports, 4.135c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.787c; Gulf ports, 4.308c; Pacific ports, 4.525c.

Clad Steel Plates: Coatesville, 10% cladding: nickel-clad, 18.72c; inconel-clad, 26.00c; monel-clad, 24.96c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.35c; Geneva, Utah, 2.50c; New York, del., 2.54c; Phila., del., 2.48c; Pacific ports, 3.035c; Gulf ports, 2.735c.

(Phoenix Iron Co., Phoenixville, Pa., quotes the equivalent of 2.60c. Bethlehem, Pa., on the general range and 2.70c on beams and channels from 4 to 10 inches.)

Steel Piling: Pittsburgh, Chicago, Buffalo, 2.65c; Pacific ports, 3.235c.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).

Wire to Manufacturers in carloads

Bright, basic or bessemer	*$3.05
Spring (except Birmingham)	*$4.00
Wire Products to Trade	
Nails and Staples	
Standard and cement-coated	†$3.75
Galvanized	‡$3.40
Wire, Merchant Quality	
Annealed	§$3.50
Galvanized	§$.385

(Fob Pittsburgh, Chicago, Cleveland, Birmingham, per base column)

Woven fence, 15½ gage and heavier	**72
Barb d wire, 80-rod spool	††79
Barbless wire, twisted	††79
Fence posts	74
Bale ties, single loop	72½

*Add $0.10 for Worcester, $0.05 for Duluth and $0.535 for Pacific ports.

†Add $0.30 for Worcester, $0.535 for Pacific ports. Nichols Wire & Steel, $4.25; Pittsburgh Steel Co., $4.10.

‡Add $0.535 for Pacific ports.

§Add $0.10 for Worcester; $0.735 Pacific ports.

**Pittsburgh Steel Co., 77.

††Pittsburgh Steel Co., 89.

Tubular Goods

Welded Pipe: Base price in carloads, threaded and coupled to consumers about $200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain O.; Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Welded

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
⅛	53	30	¼	21	0½
¼ & ⅜	56	37½	¾	27	7
½	60½	48	1-1¼	31	13
⅝	63½	52	1½	35	15½
1-3	65½	54½	2	34½	15

Lap Weld

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
2	58	46½	1¼	20	0½
2½-3	61	49½	1½	25½	7
3½-6	63	51½	2	27½	9
7-8	62	49½	2½-3½	28½	11½
9-10	61½	49	4	30½	15
11-12	60½	48	4½-8	29½	14
			9-12	25½	9

Boiler Tubes: Net base prices per 100 feet fob Pittsburgh in carload lots, minimum wall, cut length 4 to 24 feet, inclusive.

O.D. sizes	B.W.G.	—Seamless— Hot Rolled	Cold Drawn	—Elec. Weld— Hot Rolled	Cold Rolled
1"	13	....	$9.90	$9.36	$9.65
1¼"	13	....	11.73	9.63	11.43
1½"	13	$10.91	12.96	10.63	12.64
1¾"	13	12.41	14.75	12.10	14.37
2"	13	13.90	16.52	13.53	16.19
2¼"	13	15.50	18.42	15.06	18.03
2¼"	12	17.07	20.28	16.57	19.83
2½"	12	18.70	22.21	18.11	21.68
2¾"	12	19.82	23.54	19.17	22.95
3"	12	20.79	24.71	20.05	24.02
3½"	11	26.24	31.18	25.30	30.29
4"	10	32.56	38.68	31.32	37.52
4½"	9	43.16	51.29	....	....
5"	9	49.96	59.36	....	....
6"	7	76.71	91.14	....	....

Pipe, Cast Iron: Class B, 6-in. and over, $60 per net ton, Birmingham; $65, Burlington, N. J.; $62.80, del., Chicago; 4-in. pipe, $5 higher, Class A pipe, $3 a ton over class B.

Rails, Supplies

Standard rails, over 60-lb, fob mill, net ton, $43.40. Light rails (billet), Pittsburgh, Chicago, Birmingham, net ton, $49.18.

Relaying rails, 35 lb and over, fob railroad and basing points, $31-$33.

Supplies: Track bolts, 6.50c; heat treated, 6.75c. Tie plates $51 net ton, base, Standard spikes, 3.65c

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago. Additional discounts: 5 for carloads; 10 for full containers, except tire, step and plow bolts.

(Base prices advanced 12 per cent, effective July 27, 1946; discounts remain unchanged.)

Carriage and Machine

½ x 6 and smaller	65½ off
Do., ⅝ and ⅝ x 6-in. and shorter	63½ off
Do., ¾ to 1 x 6-in. and shorter	61 off
1⅛ and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off
Step bolts	56 off
Plow bolts	65 off

Stove Bolts

In packages, nuts separate, 71-10 off, nuts attached, 71 off; bulk, 80 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hex	U.S.S.	S.A.E.
⅞-in. and smaller	..	64
1-in. and smaller	62	..
1-in.-1-in.	..	60
⅛-in.-1-in.	59	..
1⅛-in.-1½-in.	57	58
1⅝-in. and larger	56	..

Additional discount of 10 for full kegs.

Hexagon Cap Screws

Upset 1-in., smaller	64 off
Milled 1-in., smaller	60 off

Square Head Set Screws

Upset 1-in. and smaller	71 off
Headless, ¼-in. and larger	60 off
No. 10 and smaller	70 off

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural	4.75c
⅞-inch and under	*65-5 off

*Plus 12 per cent increase on base prices effective July 26.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $2.75-$3.00 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 15.15c; extra carbon 19.48c; special carbon 23.80c; oil-hardening 25.97c; high carbon-chromium 46.53c.

W	Cr	V	Mo	Base, per lb
18.00	4	1	...	72.49c
1.5	4	1	8.5	58.43c
.	4	2	3	58.43c
6.40	4.15	1.90	5	62.22c
5.50	4.50	4	4.50	75.74c

Stainless Steels

Base, Cents per lb

CHROMIUM NICKEL STEELS

	Bars	Plates	Sheets	H.R. Strip	C.R. Strip
302	25.96c	29.21c	36.79c	23.93c	30.30c
303	28.13	31.38	38.95	29.21	35.71
304	27.05	31.38	38.95	25.45	32.46
308	31.38	36.79	44.36	30.84	37.87
309	38.95	43.28	50.85	40.03	50.85
310	53.02	56.26	57.35	52.74	60.50
312	38.95	43.28	53.02	....	....
*316	43.28	47.61	51.94	43.28	51.94
‡321	31.38	36.79	44.36	31.65	41.12
†347	35.71	41.12	48.69	35.71	45.44
431	20.56	23.80	31.38	18.94	24.36

STRAIGHT CHROMIUM STEEL

403	23.93	26.51	31.92	22.98	29.21
**410	20.02	23.93	28.67	18.39	23.80
416	20.56	23.80	29.21	19.75	25.45
††420	25.96	30.84	36.25	25.70	39.49
430	20.56	23.80	31.38	18.94	24.36
‡‡430F	21.10	24.35	31.92	20.29	26.51
440A	25.96	30.84	36.25	25.70	39.49
442	24.35	27.59	35.17	25.96	34.62
443	24.35	27.59	35.17	25.96	34.62
446	29.76	33.00	39.19	37.87	56.26
501	8.66	12.98	17.04	12.98	18.39
502	9.74	14.07	18.12	14.07	19.48

STAINLESS CLAD STEEL (20%)

(Fob Pittsburgh and Washington, Pa., plate prices include annealing and pickling.)

304	....	19.48	20.56	....	....
410	....	17.31	18.39	....	....
430	....	17.85	18.94	....	....
446	....	19.48	20.56	....	....

* With 2-3% molybdenum. § With titanium. † With columbium. ** Plus machining agent. †† High carbon. ‡‡ Free machining.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	*$8.75
Connellsville, foundry	9.25- 9.75
New River, foundry	10.25-10.50
Wise county, foundry	9.00- 9.50
Wise county, furnace	8.50- 9.00

By-Product Foundry

Kearney, N. J., ovens	14.40
Chicago, outside delivered	14.59
Chicago, delivered	15.10
Terre Haute, delivered	14.85
Milwaukee, ovens	15.10
New England, delivered	16.00
St. Louis, delivered	†15.10
Birmingham, delivered	12.28
Indianapolis, delivered	14.85
Cincinnati, delivered	14.60
Cleveland, delivered	14.85
Buffalo, delivered	14.75
Detroit, delivered	15.10
Philadelphia, delivered	14.65

* Operators of hand-drawn ovens using trucked coal, $9.35.

† 15.68 from other than Ala., Mo., Tenn.

Coke By-Products

Spot, gal, freight allowed east of Omaha.	
Pure and 90% benzol	15.00c
Toluol, two degree	22.00c
Industrial xylol	22.00c
Per pound fob works	
Phenol (car lots, returnable drums)	11.25c
Do., less than carlots	12.00c
Do., tank cars	10.25c
Eastern plants, per pound	
Naphthalene flakes, balls, bbl, to jobbers, "household use"	9.00c
Per ton, bulk, fob plants	
Sulphate of ammonia	$30.00

WAREHOUSE STEEL PRICES

Base delivered prices, cents per pound, for delivery within switching limits, subject to established extras. Quotations based on mill prices announced March 1, 1946

	Hot-rolled bars	Structural shapes	Plates	Floor plates	Hot-rolled sheets (10-gage base)	Hot-rolled strip (14-gage and lighter, 6-in. and narrower)	Hot-rolled strip (12-gage and heavier wider than 6-inch)	Galvanized flat sheets (24-gage base)	Cold-rolled sheets (17-gage base)	Cold finished bars	Cold-rolled strip
Boston	4.35[6][1]	4.20[3][1]	4.20[3][1]	6.03[9][1]	4.05[0][1]	5.54[8][1]	4.41[8][1]	5.72[5][13]	5.03[1][14]	4.65[6][21]	4.965
New York	4.13[4][1]	4.03[8][1]	4.04[9][1]	5.87[5][1]	3.85[6][1]	4.37[5][1]	4.27[5][1]	5.50[1][13]	4.83[8][14]	4.58[4][21]	5.075
Jersey City	4.15[5][1]	4.01[8][1]	4.04[9][1]	5.87[5][1]	3.85[6][1]	4.37[5][1]	4.27[5][1]	5.50[1][13]	4.89[0][14]	4.60[5][21]	5.075
Philadelphia	4.11[4][1]	3.93[7][1]	3.87[5][1]	5.56[4][1]	3.77[4][1]	4.66[4][1]	4.55[4][1]	5.49[9][15]	5.13[9][26]	4.56[4][21]	5.064
Baltimore	4.09[3][1]	4.05[1]	3.86[5][1]	5.54[3][1]	3.64[1]	4.29[3][1]	4.19[3][1]	5.36[5][17]	5.11[8][30]	4.54[3][21]	....
Washington	4.23[2][1]	4.22[1]	4.06[7][1]	5.63[2][1]	3.84[2][1]	4.43[2][1]	4.33[2][1]	5.66[7][17]	5.00[7][34]	4.53[2][21]	....
Norfolk, Va.	4.37[7][1]	4.30[3][1]	4.26[2][1]	5.77[7][1]	4.03[7][1]	4.92[7][1]	4.47[7][1]	5.86[2][17]	4.55[2][34]	4.67[7][21]	....
Bethlehem, Pa.*	....	3.70[1]	....	....	....	....	....	....	....	....	....
Claymont, Del.*	....	....	3.70[1]	....	....	....	....	....	....	....	....
Coatesville, Pa.*	....	....	3.70[1]	....	....	....	....	....	....	....	....
Buffalo (city)	3.60[1]	3.65[1]	3.92[1]	5.55[1]	3.57[5][1]	4.21[1]	4.11[1]	5.20[15]	4.62[5][16]	4.20[21]	4.96
Buffalo (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.47[5][1]	3.85[1]	3.75[0][1]	5.10[15]	4.52[5][16]	4.10[21]	4.60
Pittsburgh (city)	3.60[1]	3.65[1]	3.65[1]	5.25[1]	3.57[5][1]	3.95[1]	3.85[0][1]	5.32[7][13]	4.62[5][34]	4.20[21]	4.70
Pittsburgh (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.47[5][1]	3.85[1]	3.75[0][1]	5.10[13]	4.52[5][34]	4.10[21]	4.60
Cleveland (city)	3.60[1]	3.88[1]	3.65[1]	5.48[1]	3.57[5][1]	3.95[1]	3.85[0][1]	5.34[7][13]	4.62[5][34]	4.20[21]	4.70
Cleveland (country)	3.50[1]	....	3.55[1]	....	3.47[5][1]	3.85[1]	3.75[0][1]	....	4.52[5][34]	4.10[21]	4.00
Detroit	3.73[5][1]	3.98[7][1]	3.93[5][1]	5.60[7][1]	3.71[0][1]	4.08[5][1]	3.98[5][1]	5.52[6][15]	4.76[0][34]	4.25[12]	4.985
Omaha (city, del.)	4.32[1]	4.37[1]	4.37[1]	5.97[1]	4.04[5][1]	4.52[1]	4.42[1]	6.00[16]	5.72[34]	4.94[5][21]	....
Omaha (country)	4.22[1]	4.27[1]	4.27[1]	5.87[1]	3.94[5][1]	4.42[1]	4.32[1]	5.90[15]	....	....	....
Cincinnati	3.90[2][1]	3.98[3][1]	3.95[2][1]	5.58[3][1]	3.67[1][1]	4.04[6][1]	3.94[6][1]	5.29[6][15]	4.27[1][34]	4.60[2][21]	....
Youngstown*	....	....	....	....	....	....	....	4.85[13]	....	....	....
Middletown, O.*	....	....	....	....	3.47[5][1]	3.85[1]	3.75[0][1]	5.10[16]	....	....	....
Chicago (city)	3.75[1]	3.80[1]	3.80[1]	5.40[5]	3.47[5][1]	3.95[1]	3.85[0][1]	5.40[15]	4.42[5][34]	4.20[21]	4.90
Milwaukee	3.90[8][1]	3.95[8][1]	3.95[8][1]	5.55[8][1]	3.63[3][1]	4.10[8][1]	4.00[8][1]	5.55[8][15]	4.58[3][34]	4.35[8][21]	5.058
Indianapolis	3.83[1]	3.88[1]	3.88[1]	5.48[1]	3.74[3][1]	4.11[8][1]	4.01[8][1]	5.36[8][15]	4.79[3][34]	4.43[11]	5.060
St. Paul	4.09[2][3]	4.14[2][3]	4.14[2][3]	5.74[2][3]	3.81[7][3]	4.29[2][3]	4.19[2][3]	5.66[6][15]	4.76[7][34]	4.85[2][21]	5.398
St. Louis	3.91[8][1]	3.96[8][1]	3.96[8][1]	5.56[8][1]	3.64[3][1]	4.11[8][1]	4.01[8][1]	5.62[2][15]	4.59[3][34]	4.52[2][21]	5.222
Memphis, Tenn.	4.29[6][1]	4.34[6][1]	4.34[6][1]	6.07[1][1]	4.22[1][1]	4.59[6][1]	4.49[6][5]	5.74[6][15]	....	4.82[1][21]	....
Birmingham	3.75[1]	3.80[1]	3.80[1]	6.15[3][1]	3.67[5][1]	4.05[1]	4.05[1]	5.20[15]	5.07[7][34]	4.99[21]	5.465
New Orleans (city)	4.35[8][1]	4.40[8][1]	4.40[8][1]	6.32[9][1]	4.28[3][1]	4.65[8][1]	....	5.80[8][15]	5.30[4][34]	5.07[9][21]	....
Houston, Tex.	4.00[3]	4.50[1]	4.50[1]	5.75[3]	3.98[8][3]	4.66[8][3]	4.56[3][6]	5.76[3][34]	5.81[9][16]	4.10[21]	....
Los Angeles	4.65[4]	4.70[4]	5.80[4]	7.05[4]	4.95[4]	5.30[4]	5.20[0][4]	6.55[13]	6.60[6]	6.10[5][21]	5.868
San Francisco	4.23[5][7]	4.18[5][7]	4.18[5][7]	5.88[5][7]	4.16[7]	5.88[5][1]	4.53[5][1]	6.38[5][15]	6.91[13]	5.78[3][21]	7.588
Portland, Oreg.	4.70[27]	4.70[27]	5.00[27]	6.75[27]	4.87[5][27]	6.65[27]	5.00[0][27]	6.20[15]	6.82[5][16]	5.98[3][15]	....
Tacoma, Wash.	4.60[6]	4.70[6]	5.00[6]	6.75[6]	4.87[6]	5.80[6]	4.60[6]	6.40[15]	6.55[15]	6.23[21]	....
Seattle	4.60[6]	4.70[6]	5.00[6]	6.75[6]	4.87[6]	5.80[6]	4.60[6]	6.40[15]	6.55[15]	6.23[21]	....

* Basing point cities with quotations representing mill prices, plus warehouse spread.

BASE QUANTITIES

[1]—400 to 1999 pounds; [2]—400 to 14,999 pounds; [3]—any quantity; [4]—300 to 1999 pounds; [5]—400 to 8999 pounds; [6]—300 to 9999 pounds; [7]—400 to 39,999 pounds; [8]—under 2000 pounds; [9]—under 4000 pounds; [10]—500 to 1499 pounds; [11]—one bundle to 39,999 pounds; [12]—150 to 2249 pounds; [13]—150 to 1499 pounds; [14]—three to 24 bundles; [15]—450 to 1499 pounds; [16]—one bundle to 1499 pounds; [17]—one to nine bundles; [18]—one to six bundles; [19]—100 to 749 pounds; [20]—300 to 1999 pounds; [21]—1500 to 39,999 pounds; [22]—1500 to 1999 pounds; [23]—1000 to 39,999 pounds; [24]—400 to 1499 pounds; [25]—1000 to 1999 pounds; [26]—under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, base; [27]—300 to 4999 pounds.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$5.45
Mesabi nonbessemer	5.05
High phosphorus	5.05
Mesabi bessemer	5.20
Old range nonbessemer	5.30

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	13.00

Foreign Ore

Cents per unit, cif Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mn.,	Nom.
N. African low phos.	Nom.
Swedish basic, 60 to 68%	13.00
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro	7.50–8.00

Tungsten Ore

Chinese Wolframite, per short ton unit, duty paid	$24.00

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African

48% 2.8:1	$39.75
48% 3:1	41.00
48% no ratio	31.00

South African (Transvaal)

44% no ratio	$27.40
45% no ratio	28.30
48% no ratio	31.00
50% no ratio	32.80

Brazilian—nominal

44% 2.5:1 lump	$33.65
48% 3:1 lump	43.50

Rhodesian

45% no ratio	$28.30
48% no ratio	31.00
48% 3:1 lump	41.00

Domestic (seller's nearest rail)

48% 3:1 less $7 freight allowance.	$43.50

Manganese Ore

Sales prices of Office of Metals Reserve, cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85c; Fontana, Calif., Provo, Utah, and Pueblo, Colo., 91c; prices include duty on imported ore and are subject to established premiums, penalties and other provisions. Price at basing points which are also points of discharge of imported manganese ore is fob cars, shipside, at dock most favorable to the buyer. Outside shipments direct to consumers at 15c to 17c per unit less than Metal Reserve prices.

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy content)

Designation	Chemical Composition Limits, Per Cent — Carbon	Mn	Si	Cr	Ni	Mo	Basic open-hearth Electric furnaces: Bars per 100 lb	Billets per GT	Bars per 100 lb	Billets per GT
NE 9415	.13-.18	.80-1.10	.20-.35	.30-.50	.30-.60	.08-.15	$0.812	$16.230	$1.353	$27.050
NE 9425	.23-.28	.80-1.20	.20-.35	.30-.50	.30-.60	.08-.15	.812	16.230	1.353	27.050
NE 9442	.40-.45	1.00-1.30	.20-.35	.30-.50	.30-.60	.08-.15	.866	17.312	1.407	28.132
NE 9722	.20-.25	.50-.80	.20-.35	.10-.25	.40-.70	.15-.25	.703	14.066	1.244	24.886
NE 9912	.10-.15	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.542
NE 9920	.18-.23	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.542

Extras are in addition to a base price of 2.921c per pound on finished products and $58.43 per gross ton on semifinished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.

PIG IRON

Maximum prices per gross ton. Delivered prices do not include 3 per cent federal tax, effective Dec. 1, 1942.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$29.50	$29.00	$30.50	$30.00
Newark, N. J., del.	31.20	30.70	32.20	31.70
Brooklyn, N. Y., del.	32.28	....	....	32.78
Birdsboro, Pa., base	29.50	29.00	30.50	30.00
Birmingham, base	24.88	23.50	29.50	....
Baltimore, del.	30.22	....	....	....
Boston, del.	29.68	....	....	....
Chicago, del.	28.72	....	....	....
Cincinnati, del.	28.94	28.06	....	....
Cleveland, del.	28.62	27.74	....	....
Newark, N. J.	30.82	....	....	....
Philadelphia, del.	30.05	29.55	....	....
St. Louis, del.	28.62	29.54	....	....
Buffalo, base	28.50	27.50	29.50	29.00
Boston, del.	30.06	29.56	31.06	30.56
Rochester, del.	30.03	....	31.03	30.53
Syracuse, del.	30.58	....	31.58	31.08
Chicago, base	28.50	28.00	29.00	28.50
Milwaukee, del.	29.73	29.23	30.23	29.73
Muskegon, Mich., del.	32.05	....	....	32.05
Cleveland, base	28.50	28.00	29.00	28.50
Akron, Canton, del.	30.04	29.54	30.54	30.04
Detroit, base	28.50	28.00	29.00	28.50
Saginaw, Mich., del.	30.81	30.31	31.31	30.81
Duluth, base	29.00	28.50	29.50	29.00
St. Paul, del.	31.13	30.63	31.63	31.13
Erie, Pa., base	28.50	28.00	29.50	29.00
Everett, Mass., base	29.50	29.00	30.50	30.00
Boston, del.	30.06	29.56	31.06	30.56
Granite City, Ill., base	28.50	28.00	29.00	28.50
St. Louis, del.	29.00	28.50	....	29.00
Hamilton, O., base	28.50	28.00	....	28.50
Cincinnati, del.	29.68	29.18	....	29.68
Neville Island, Pa., base	28.50	28.00	29.00	28.50
*Pittsburgh, del., N.&S. sides	29.27	28.77	29.77	29.27
Provo, Utah, base	26.50	26.00	....	....
Sharpsville, Pa., base	28.50	28.00	29.00	28.50
Sparrows Point, base	29.50	29.00	....	....
Baltimore, del.	30.60	....	....	....
Steelton, Pa., base	....	29.00	....	....
Swedeland, Pa., base	29.50	29.00	30.50	30.00
Philadelphia, del.	30.43	29.93	....	30.93
Toledo, O., base	28.50	28.00	29.00	28.50
Youngstown, O., base	28.50	28.00	29.00	28.50
Mansfield, O., del.	30.66	30.16	31.16	30.66

* To Neville Island base add: 61c for McKees Rocks, Pa.; 93c Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97c (water), Monongahela; $1.24, Oakmont, Verona; $1.38, Brackenridge.

Exceptions to above prices: Struthers Iron & Steel Co., Struthers, O., may charge 50 cents a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable pig iron. Republic Steel Corp. may quote $2 a ton higher for foundry and basic pig iron on the Birmingham base.

High Silicon, Silvery

6.00-6.50 per cent (base).....$34.00

6.51-7.00	$35.00	9.01- 9.50	40.00
7.01-7.50	36.00	9.51-10.00	41.00
7.51-8.00	37.00	10.01-10.50	42.00
8.01-8.50	38.00	10.51-11.00	43.00
8.51-9.00	39.00	11.01-11.50	44.00

Fob Jackson county, O., per gross ton. Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Electric Furnace Ferrosilicon: Si 14.01-14.50%, $48, Jackson, O.; $51.25 Keokuk, Iowa; $49.25 Niagara Falls, N. Y. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045 % max. phos.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

Charcoal Pig Iron

Semi-cold blast, low phosphorus.

Fob furnace, Lyles, Tenn. $33.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $28.00
Valley base 28.00

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Buffalo, N. Y., $34.00 base; $35.38, del., Philadelphia. Intermediate phosphorus, Central Furnace, Cleveland, $31.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge not to exceed 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge not to exceed 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Refractories

Per 1000, fob shipping point
Net prices

Fire Clay Brick

Super Duty
Pa., Mo., Ky. $81.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	65.00
Ala., Ga.	65.00
N. J.	70.00

Intermediate Heat Duty

Ohio	57.00
Pa., Ill., Md., Mo., Ky.	59.00
Ala., Ga.	51.00
N. J.	62.00

Low Heat Duty

Pa., Md., Ohio	51.00

Malleable Bung Brick

All bases	75.00

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry Press	42.00
Wire Cut	40.00

Silica Brick

Pennsylvania	65.00
Joliet, E. Chicago	74.00
Birmingham, Ala.	65.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	22.00
Bags	26.00

Basic Brick

Net ton, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00

Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

Open Market Prices of Leading Ferroalloy Products

Spiegeleisen: 19-21% carlot per gross ton, Palmerton, Pa., $36; Pittsburgh, $40.50; Chicago, $40.60.

Ferromanganese, standard: 78-82% c.l. gross ton, duty paid, $135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Rockdale or Rockwood, Tenn. (where Tennessee Products Co. is producer), Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); $140 fob cars, Pittsburgh (where Carnegie-Illinois Steel Corp. is producer); add $6 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone; Special, 21c; regular, 20.50c; medium, 14.50c; central zone: special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.55c; regular, 21.05c; medium, 15.75c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Ferromanganese Briquets: (Weight approx. 3 lb and containing exactly 2 lb Mn) per lb of briquets. Contract, carlots, bulk 0.0605c, packed 0.063c, tons 0.0655c, less 0.068c, eastern, freight allowed; 0.063c, 0.0655c, 0.0755c and 0.078c, central; 0.066c, 0.0685c, 0.0855c and 0.088c, western; spot up 0.25c.

Ferrotungsten: Spot 10,000 lb or more, per lb contained W, $1.90; contract, $1.88; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots $1.23; less-ton lots $1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb contained Ti; ton lots $1.35; less-ton lots $1.40 eastern. Spot up 5c per lb.

Ferrotitanium, High-Carbon: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C $142.50; 3-5% C $157.50.

Ferrovanadium: V 35-55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Ferromolybdenum: 55-75% per lb. contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of $3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.l. 12.65c, ton lots 13.10c, smaller lots 13.50c; 80-90% c.l. 10.35c, ton lots 10.85c, smaller lots 11.35c; 75% c.l. 9.40c, ton lots 9.95c, smaller lots 10.45c; 50% c.l. 7.90c, ton lots 8.50c, smaller lots 9.10c. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%. Deduct 0.85c for bulk carlots.

Ferro Boron: (B 17.50% max. and C 1.50% max., Al 0.50% max. and C 0.50% max.) per lb of alloy contract ton lots $1.20, less ton lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

Ferrocolumbium: 50-60% per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.25; less-ton lots $2.30. Spot prices up 10 cents.

Ferrochrome: Contract, lump, packed; **high carbon,** eastern zone, c.l. 15.05c, ton lots 15.55c; central zone, add 0.40c and 0.65c; western zone, add 0.5c and 1.85c; **high carbon, high nitrogen,** add 5c to all high carbon ferrochrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c.

Low carbon, eastern zone, bulk, c.l., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22c, 0.2% 21.50c, 0.5% 21c, 1% 20.50c, 2% 19.50c, add 1c for 2000 lb to c.l.; central zone, add 0.4c for bulk, c.l., and 0.65c for 2000 lb to c.l.; western zone, add 0.5c for bulk, c.l., and 1.85c for 2000 lb to c.l.; carload packed differential 0.45c. Prices are per pound of contained Cr, fob shipping points.

Low carbon, high nitrogen: Add 2c to low carbon ferrochrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

Ferrochrome, Special Foundry: (Cr 62-66%, C about 5-7%.) Contract, lump packed, eastern zone, freight allowed, c.l. 15.60c, ton lots 16.10c, less than ton 16.75c; central zone, add 0.40c for c.l. and 0.65c for smaller lots; western zone, add 0.5c for c.l. and 1.85c for smaller lots. Deduct 0.55c for bulk carlots.

S. M. Ferrochrome, high carbon: (Cr 60-65%, Si, Mn and C 4-6% each.) Contract, lump, packed, eastern zone, freight allowed, c.l. 16.15c, ton lots 16.65c, less ton 17.30c; central zone, add 0.40c for c.l. and 0.65c for smaller lots; western zone, add 0.5c for c.l. and 1.05c for smaller lots. Prices are per lb of contained chromium; spot prices 0.25c higher. Deduct 0.55c for bulk carlots.

S. M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk, 20.00c, packed 20.15c ton lots 21.00c, less ton lots 22.00c eastern, freight allowed, per pound contained chromium, 20.40c, 20.50c, 20.95c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up 0.25c.

Ferrochrome Briquets: Containing exactly 2 lb Cr, packed eastern zone, c.l. 9.50c, ton lots 9.50c less than ton 10.10c, central zone, add 0.3c for c.l. and 0.5c for smaller lots; western zone, add 0.70c for c.l. and 2c for smaller lots. Deduct 0.30c for bulk carlots. Prices per lb of briquets; spot prices 0.25c higher.

Chromium Metal: 97% min chromium, max. 0.50% carbon, eastern zone, per lb contained chromium bulk, c.l., 79.50c, 2000 lb to c.l. 80c, central 81c and 82.60c; western 82.25c and 84.75c fob shipping point, freight allowed.

Chromium-Copper: (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Calcium metal; cast: Contract ton lots or more $1.35, less, $1.60, pound of metal; $1.36 and $1.61

central, $1.40 and $1.65, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb. of alloy. Contract, carlots, 15.50c, ton lots 16.50c and less 17.00c, eastern, freight allowed; 16.00c, 17.35c, and 17.85c, central; 18.05c, 19.16c and 19.60c western; spot up 0.25c.

Calcium-Silicon: (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy. Contract, carlot, lump 13.00c, ton lots 14.50c, less 15.50c eastern, freight allowed; 13.50c, 15.25c and 16.25c central; 15.55c, 17.40c and 18.40c, western; spot up 0.25c.

Silicon Metal: Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l., 12.90c; 2000 lb to c.l., 13.45c; central, 13.20c and 13.90c; western, 13.85c and 16.80c; min. 96% Si and max. 2% Fe, eastern, bulk; c.l., 12.50c, 2000 lb to c.l., 13.10c; central, 12.80c and 13.55c; western, 13.45c and 16.50c, fob shipping point, freight allowed. Price per lb contained Si.

Silicomanganese, containing exactly 2 lb Mn and about ¼ lb Si, eastern zone, bulk, c.l. 5.80c, ton lots 6.35c; central zone, add 0.25c for c.l. and 1c for ton lots; western, add 0.55c for c.l. and 0.20c for ton lots. **Ferrosilicon,** weighing about 5 lb and containing exactly 2 lb Si, or about 2¼ lb and containing exactly 1 lb Si, packed, eastern zone, c.l. 3.90c, ton lots 4.15c, less ton lots 4.45c; central zone, add 0.15c for c.l. and 0.40c for smaller lots; western zone, add 0.30c for c.l. and 0.45c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.30c for bulk carlots.

Manganese Metal: (Min. 96% Mn, max. 2% Fe), per lb of metal, eastern zone, bulk, c.l., 30c, 2000 lb to c.l., 32c, central, 30.25c, and 33c; western, 30.55c and 35.05c.

Electrolytic Manganese: 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more: Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1½c for hydrogen-removed metal.

Manganese-Boron: (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) per lb of alloy. Contract ton lots, $1.89, less $2.01, eastern; freight allowed; $1.903 and $2.023, central, $1.935 and $2.055 western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni, balance), per lb of alloy. Contract, 5 tons or more, $1.90, 1 ton to 8 tons, $2.00, less than ton $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

Borosil: 3 to 4% B, 40 to 45% Si, $6.25 lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: B 1.5-1.9%, ton lots, 45c lb; less-ton lots, 50c lb.

Carbortam: B 0.90 to 1.15% net ton to carload, 8c per lb fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy contract, carlots 25.00c, ton lots 26.00c, less ton lots 27.00c, eastern, freight allowed, 25.50c, 26.75c and 27.75c, central; 27.50c, 28.90c and 29.90c, western; spot up 0.25c.

Silvaz Alloy: (Si 35-40%, Va 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy. Contract, carlots 58.00c, ton lots 59.00c, less 60.00c, eastern freight allowed; 58.50c, 59.75c and 60.75c, central; 60.50c, 61.90c and 62.90c, western; spot up 0.25c.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) per lb of alloy contract carlots 11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight allowed; 12.00c, 12.85c and 13.35c, central zone; 14.05c, 14.60c and 15.10c, western; spot up 0.25c.

CMSZ Alloy 4: (Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75% and C 3.00-4.50%). Contract carlots, bulk, 11.00c and packed 11.50c; ton lots 12.00c; less 12.50c, eastern, freight allowed; 11.50c and 12.00c, 12.75c, 13.25c, central; 13.50c and 14.00c, 14.75c, 15.25c, western; spot up 0.25c.

CMSZ Alloy 5: (Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%) per lb of alloy. Contract, carlots, bulk, 10.75c, packed 11.25c, ton lots 11.75c, less 12.25c, eastern, freight allowed; 11.25c, 11.75c, 12.50c and 13.00c, central; 13.25c and 13.75c, 14.50c and 15.00c, western; spot up 0.25c.

Zirconium Alloy: 12-15%, per lb of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads, bulk, per gross ton $102.50; packed $107.50; ton lots $108; less-ton lots $112.50. Spot up $5 per ton.

Zirconium Alloy: Zr 35-40%, eastern, contract basis, carloads in bulk or package, per lb of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot up ¼c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) contract basis fob Niagara Falls, N. Y., lump per lb 6.25c; ton lots 6.75c; less 7.25c. Spot up ½c.

Simanal: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, less-ton lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Tungsten Metal Powder: Spot, not less than 97%, $2.50-$2.60; freight allowed as far west as St. Louis.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

Vanadium Pentoxide, technical grade: Fused, approx. 89-92% V_2O_5 and 5.84% NA_2O; or air dried, 83-85% V_2O_5 and 5.15% NA_2O, $1.10 per lb contained V_2O_5, fob plant, freight allowed on quantities of 25 lb and over to St. Louis.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, delivered at consumer's plant except where noted. Prices mainly nominal pending clarification.

OPEN HEARTH AND BLAST FURNACE GRADES

	—Heavy Melting— No. 1	No. 2	No. 1 Busheling	—Bundles— No. 1	No. 2	No. 3	Machine Shop Turnings	Mixed Borings, Turnings	Short Shovel Turnings	Cast Iron Borings
Pittsburgh	25.00	25.00	25.00	25.00	25.00	23.00	17.50	17.50	19.50	18.50
Cleveland	24.50	24.50	24.50	24.50	24.50	22.50	17.00	17.00	19.00	16.50
Valley	25.00	....	....	25.00	....	....	17.50	....	19.50	18.50
Mansfield	....	....	....	....	....	....	17.50	....	....	....
Chicago	23.75	23.75	23.75	23.75	23.75	21.75	16.25	16.25	18.25	18.25
‡Detroit	22.32	....	22.32	22.32	22.32	20.32	14.82	14.82	16.82	15.82
St. Louis	20.00	....	....	....	....	....	13.00	....	15.00	....
Cincinnati	24.50	24.50	....	24.50	24.50	....	13.50	13.50	15.50	15.50
Birmingham	19.50	19.50	19.50	....	19.50	17.50	....	....	14.50	15.50
San Francisco	19.50	19.50	19.50	19.50	19.50	11.50	9.50	....	....	....
Seattle	17.00	17.00	....	....	....	....	....	....	....	....
Los Angeles	16.50	15.50	....	14.50	14.50	....	8.00	8.00	....	....

ELECTRIC FURNACE, FOUNDRY AND SPECIAL GRADES

	Bar Crops and Plate	Cast Steel	Punchings and Plate Scrap	Electric Furnace Bundles	Heavy Turnings	Alloy Free Turnings	Cut Structural —and Plate Scrap— 1 ft and under	2 ft and under	No. 1 Cast Iron Borings	Tin Can Bundles
Cleveland	27.00	27.00	27.00	25.50	24.00	22.50	27.00	26.50	23.50	20.50
Pittsburgh	27.50	27.50	27.50	26.00	24.50	23.00	27.50	27.00	24.00	21.00
Chicago	....	....	23.75	....	....	....	....	....	....	....
‡Detroit	....	....	24.82	23.82	....	....	....	....	....	....
Birmingham	18.00	....	....	....	....	....	21.50	21.00	....	....
San Francisco	....	....	....	....	....	....	....	....	....	....

STEEL GRADES OF RAILROAD ORIGIN

	No. 1 Heavy Melting R.R. Steel	Railroad Malleable	Axles	—Rails— Rerolling	Random Lengths	Cut 3-ft. and under	Cut 18-in. and under	Railroad Specialties	Uncut Tires	Angles, Splice Bars
Pittsburgh	26 00	27.00	31.00	28.50	26.50	28.50	29.50	29.50	28.50	28.50
Valley	23.50	....	....	....	....	....	....	....	....	....
‡Chicago	22.25	24.50	....	24.75	22.75	24.75	26.00	25.25	....	24.75
St. Louis	....	24.50	27.00	23.50	21.50	24.00	....	....	23.50	23.50
Cincinnati	....	....	....	....	26.00	....	....	....	....	....
Birmingham	....	....	26.50	23.00	21.00	....	....	....	....	23.00
San Francisco	....	....	26.50	....	21.00	....	....	....	23.00	....
Seattle	17.00	....	....	....	....	....	....	....	....	....

CAST IRON GRADES

	No. 1 Cupola Cast	Charging Box Cast	Heavy Breakable Cast	Stove Plate	Unstripped Motor Blocks	Malleable	Brake Shoes	Clean Auto Cast	No 1 Wheels	Burnt Cast
Cleveland	30.00–35.00	26.00–31.00	25.00–30.00	28.00–33.00	25.00–35.00	....	20.00–21.50	29.25–30.75	24.25–25.75	20.00–21.50
Buffalo	27.00–28.00	23.25–24.50	23.25–24.50	25.25–27.00	22.25–24.00	....	22.75–32.75	32.00–42.00	27.00–37.00	22.75–32.75
*Pittsburgh	27.00	23.00	22.00	25.00	22.00	26.00	19.75	29.00	24.00	19.75
*Chicago	30.00	....	....	....	....	29.00	....	32.00	....	....
‡Detroit	30.00	....	25.00	....	....	....	....	....	....	....
*St. Louis	30.00	26.00	25.00	28.00	....	....	22.75	32.00	27.00	22.75
Cincinnati	30.00	....	25.00	28.00	....	....	....	....	....	....
Birmingham	30.00	....	25.00	28.00	25.00	....	22.75	....	27.00	....
Los Angeles	30.00	....	....	....	....	....	....	....	....	....
*Seattle	30.00	....	....	....	....	....	....	....	....	....

* Fob shipping point, ‡ fob tracks, ‡ dealers buying prices.

NONFERROUS METAL PRICES

Copper: Electrolytic or Lake from producers in carlots 17.50c, del. Conn.; less carlots 17.62½c, refinery. Dealers may add ¾c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, 17.25c, refinery, 20,000 lb or more; 17.50c, less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 19.00c; 88-10-2 (No. 215) 22.75c; 80-10-10 (No. 305) 22.50c; No. 1 yellow (No. 405) 15.00c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than 20 tons.

Zinc: Price western 10.50c, select 10.60c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 10.35c, chemical 10.45c, corroding 10.45c, E. St. Louis for carlots; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukee-Kenosha districts; add 15 points for Cleveland - Akron - Detroit area, New Jersey, New York state, Texas, Pacific Coast, Richmond, Indianapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston - Worcester, Springfield, New Hampshire, Rhode Island.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 14.62½c; No. 12 foundry alloy (No. 2 grade) 14.87½c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 15.75c; grade 2 (92-95%) 15.00c; grade 3 (90-92%) 14.62½c; grade 4 (85-90%) 14.12½c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, 17 lb) 20.50c per lb, carlots; 22.50c 100 lb to c.l. Extruded 12-in. sticks 27.50c, carlots; 29.50c 100 lb to c.l.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straights, 70.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 69.87½c; Grade C, 99.65-99.79% incl. 69.62½c; Grade D, 99.50-99.64% incl., 69.50c; Grade E, 99-99.49% incl. 69.12½c; Grade F, below 99% (for tin content), 69.00c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 23.50c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 24.00c. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; and 2c for 223 lb and less; on sales by dealers, distributors and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.5%, fob refinery 35.00c lb; pig and shot produced from electrolytic cathodes 36.00c; "F" nickel shot or ingot for additions to cast iron, 34.00c.

Mercury: Open market, spot, New York, $91-$94 per 76-lb flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be, $14.75 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.25 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.30.

Cobalt: 97-99%, $1.50 lb. for 550 lb (bbl.); $1.52 lb for 100 lb (case); $1.57 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N.Y. 90.12½c per ounce.

Platinum: $70.50 per ounce.

Paladium: $24 per troy ounce.

Iridium: $125 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 17.50c, Conn., for copper. Freight prepaid on 100 lb or more.)

Sheet: Copper 28.93c; yellow brass 26.17c; commercial bronze, 95% 29.17c, 90% 28.75c; red brass, 85% 27.82c, 80% 27.41c; best quality 26.98c.

Rods: Copper, hot rolled 25.28c, cold drawn 26.28c; yellow brass 25.86c; commercial bronze, 95% 28.86c, 90% 28.44c; red brass, 85% 27.51c; 80% 27.10c; best quality 26.67c.

Seamless Tubing: Copper 28.97c; yellow brass 28.93c; commercial bronze 90% 31.16c; red brass 85% 30.48c, 80% 30.07c; best quality brass 29.39c.

Copper Wire: Bare, soft, fob eastern mills, carlots 19.89c, less carlots 20.39c; weatherproof, fob eastern mills carlot 22.07c, less carlots 22.57c; magnet, delivered, carlots, 23.30c, 15,000 lb or more 23.55c, less carlots 24.05c.

Aluminum Sheets and Circles: 2s and 3s flat mill finish, base 30,000 lb or more del.; sheet widths as indicated; circle diameter 9" and larger:

Gage	Width	Sheets	Circles
.249"-7	12"-48"	22.70c	25.20c
8-10	12"-48"	23.20c	25.70c
11-12	26"-48"	24.20c	27.00c
13-14	26"-48"	25.20c	28.50c
15-16	26"-48"	26.40c	30.40c
17-18	26"-48"	27.90c	32.90c
19-20	24"-42"	29.80c	35.30c
21-22	24"-42"	31.70c	37.20c
23-24	3"-24"	25.60c	29.20c

13.60c; cut sheets 14.10c; pipe 12.85c, New York, 12.95c, Philadelphia, Baltimore, Rochester and Buffalo, 13.45c, Chicago, Cleveland, Worcester and Boston.

Zinc Products: Sheet fob mill 15.40c, 36,000 lb and over deduct 7%, Ribbon and strip 14.50c; 3000-lb lots deduct 1%, 6000 lb 2%, 9000 lb 3%, 18,000 lb 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 13.25c; 1-3 tons 14.25c; 500-2000 lb 14.75c; 100-500 lb 15.25c; under 100 lb 16.25c. Hull plate (over 12") add 1c to boiler plate prices.

PLATING MATERIALS

Chromic Acid: 99.75%, flake, del., carloads 16.25c; 5 tons and over 16.75c; 1-5 tons 17.25c; 400 lb to 1 ton 17.75c; under 400 lb 18.25c.

Copper Anodes: In 500-lb lots, fob shipping point, freight allowed, cast oval over 15 in., nom.; curved, nom.; round oval straight, nom. electro-deposited, nom.

Copper Carbonate: 52-54% metallic Cu, 250 lb barrels nom.

Copper Cyanide: 70-71% Cu, 100-lb kegs or bbls. nom., fob, Niagara Falls.

Sodium Cyanide: 96%, 200-lb drums 15.00c; 10,000-lb lots 13.00c fob Niagara Falls.

Nickel Anodes: 500-2999 lb lots; cast and rolled carbonized 47.00c; rolled depolarized 48.00c.

Nickel Chloride: 100-lb kegs or 275-lb bbls 18.00c lb, del.

Tin Anodes: 1000 lb and over nom. del.; 500-999 nom.; 200-499 nom.; 100-199 nom.

Tin Crystals: 400 lb bbls nom., fob Grasselli, N. J.; 100-lb kegs nom.

Sodium Stannate: 100 or 300-lb drums nom., del.; tons lots nom.

Zinc Cyanide: 100-lb kegs or bbls 33.00c fob Niagara Falls.

Scrap Metals

(Prices Nominal)

Brass Mill Allowances: Prices for less than 15,000 lb fob shipping point. Add ¾c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	12.000	12.000	11.250
Yellow brass	9.875	9.625	9.125
Commercial bronze			
95%	11.250	11.000	10.500
90%	11.125	10.875	10.375
Red Brass			
85%	10.875	10.625	10.125
80%	10.875	10.625	10.125
Best quality (71-79%)	10.500	10.250	9.750
Muntz metal	9.250	9.000	8.500
Nickel silver, 5%	10.500	10.250	.....
Phos. br., A, B, 5%	12.750	12.500	11.500
Naval brass	9.500	9.250	8.750
Manganese bronze	9.500	9.250	8.750

Other than Brass Mill Scrap: Prices apply on material not meeting brass mill specifications and are fob shipping point; add ¾c for shipment of 60,000 lb of one group and ½c for 20,000 lb of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No. 1 tinned copper and copper borings 11.50c; No. 2 copper wire and mixed heavy copper, copper tuyeres 10.50c.

(Group 2) Soft red brass and borings, aluminum bronze 10.75c; copper-nickel solids and borings 11.00c; lined car boxes, cocks and faucets 9.50c; bell metal 17.25c; babbitt-line brass bushings 14.75c.

(Group 3) Admiralty condenser tubes, brass pipe 8.75c; muntz metal condenser tubes 8.25c; old rolled brass 8.25c; manganese bronze solids; (lead 0%-0.40%) 8.00c; (lead 0.41%-1%) 7.00c; manganese bronze borings, 7.25c.

Aluminum Scrap: Price fob point of shipment, truckloads of 5000 pounds or over; Segregated solids, 2S, 3S, 5c lb, 11, 14, etc., 3 to 3.50c lb. All other high grade alloys 5c lb. Segregated borings and turnings, wrought alloys, 2, 2.50c lb. Other high-grade alloys 3.50c, 4.00c lb. Mixed plant scrap, all solids, 2, 2.50c lb borings and turnings one cent less than segregated.

Lead Scrap: Prices fob point of shipment. For soft and hard lead, including cable lead, deduct 0.75c from basing point prices for refined metal.

Zinc Scrap: New clippings 8.00c, old zinc 6.50c, fob point of shipment, add ½c for 10,000 lb or more. New die cast scrap 5.70c, radiator grilles 5.70c, add ½c for 20,000 lb or more. Unsweated zinc dross, die cast slab 6.55c, any quantity.

Nickel, Monel Scrap: Prices fob point of shipment; add ½c for 2000 lb or more of nickel or cupro-nickel shipped at one time and 20,000 lb or more of monel. Converters (dealers) allowed 2c premium.

Nickel: 98% or more nickel and not over 1% copper 23.00c; 90-98% nickel, 23.00c per lb nickel contained.

Cupro-nickel: 90% or more combined nickel and copper 26.00c per lb contained nickel, plus 8.00c per lb contained copper; less than 90% combined nickel and copper 26.00c for contained nickel only.

Monel: No. 1 castings, turnings 15.00c; new clipping 20.00c; solder sheet 18.00c.

Sheets, Strip . . .

Producers cautious in accepting first quarter business. . . . Stainless grades ease

Sheet & Strip Prices, Page 144

New York—Sheet sellers who have opened their books for first quarter have been able to provide their customers with space for only limited amounts of new tonnage and in the case of coated sheets, practically none at all, so heavy are anticipated arrearages. Certain leading producers have only within the past week set up quotas and in one case for only the month of January. This latter interest plans to set up quotas on a monthly basis for at least the first quarter, in an effort to keep as closely abreast with commitments as possible. Others established their quotas on a three-month basis, although counting on having little capacity available. Certain producers, in fact, estimate that they will have no more than four weeks capacity available on the uncoated grades of carbon sheets, and none on the coated.

Stringency also is marked in electrical sheets; on the other hand, there is an appreciable easing in stainless steel schedules. As a matter of fact, there have been some cancellations recently and some leading producers now are able to make deliveries in January and February, without too much difficulty. Certain of this canceled tonnage is ascribed to the fact that consumers overbought in their efforts to find substitutes for some purposes for the scarce carbon grades. As their stocks became unbalanced by shortages in other items and components and as stainless sheets are relatively much more expensive than carbon grades, various consumers have either canceled their orders, in part at least, or have postponed delivery.

Chicago—Now that price control is off, it would not be surprising to find galvanized sheets among the first steel products to advance. Although it has been maintained that prices have been too low, it does not follow that a more favorable price will stimulate production of this extremely scarce item. Mills claim they can not divert more steel to this product and if they could they would lack sufficient manpower in the galvanizing department. Consumers are likely to get reduced quotas in 1947, and over the balance of this year nearly all tonnage is rated. So far, there is no indication of what price readjustments may be decided upon for sheets and strip, but such changes are more likely to be in extras than in base prices.

Washington — Carnegie-Illinois Steel Corp., Pittsburgh, was the only mill to quote on 2737 tons of black sheets for the naval gun factory. Contracts have been placed for 807 medium steel plates with Lukens Steel Co., Coatesville, Pa., and 85 tons of floor plates with Alan Wood Steel Co., Conshohocken, Pa.

St. Louis—Shipments of sheet improved last week due to completion of minor shifts on rolling equipment. Ingot production remains at rolling capacity. No further increase is possible until a new cold mill is installed in March. Price decontrol brought no change in demand but inquiries on impending price changes were numerous. There were no indications of cancellations, however, whatever the rise, if any, proves to be.

Boston — Sheet consumers expect an increase in galvanized prices and probably tack plate, a hot-rolled sheet grade which is used in excess of 35,000 tons annually in New England. Both grades are in shortest supply of all flat-rolled products. Inventories in carbon grades are low and out of balance, most fabricators clamoring for sheet and strip steel. Outlook for increased tonnage next quarter is not bright with available volume to apply against quotas reduced by carryovers and scattered ratings. Consumers are being asked to cancel as much unshipped overdue volume as possible and also to pare down requirements of pending deliveries to current and prospective production programs. This attempt to stabilize backlogs with orders on which deliveries may be made with more reasonable degree of promised shipments is meeting with reluctant progress. Adding to complications is the fact that some consumers are seeking new sources for sheets starting next quarter due to absorption of usual suppliers by other fabricators, Superior Sheet Steel Co., Canton, O., being a case in point. This affects some distributors. Other users, stymied in placing wanted volume with regular suppliers, are broadening inquiry lists and offering tonnage to other mills without much success. Price or an extra adjustment appears inevitable on No. 4 rolled round edge narrow cold strip. Producers have long sought higher prices on this item without success and for some time have been limiting production.

Pittsburgh — Upward adjustment in sheet and strip base prices, as well as revision in some extras, may occur soon. This is particularly probable for galvanized sheets and terne plate, reflecting increases in zinc and lead prices. About 200 pounds of zinc are required per ton of 24 gage galvanized sheets, resulting in an advance of $2.50 a ton in production costs on the basis of the 1¼-cent advance in zinc. Since July, 1938, zinc has risen 5.75 cents per pound, equivalent to $11.50 a ton on 24 gage galvanized sheet. During this same period, despite a substantial rise in labor and zinc costs, galvanized sheets have advanced only $11 a ton. No decision yet has been reached on galvanized sheet subsidy plan for the housing program. Certified tonnage ratings for this program have been extended into the first quarter. However, little change in tonnage involved under this program is indicated.

Philadelphia — District sheet prices are unchanged on the basis of 2.425c, Sparrows Point, for hot-rolled, although one mill continued to quote 3.00c, the price that had been permitted under OPA. Within the past week, two sheet mills announced quotas for shipment after Jan. 1, although one seller limited action to January. This about clears up the list of first quarter openings here. Quotas generally are small because of anticipated heavy arrearages.

Steel Plates . . .

Plate Prices, Page 145

Seattle—Plate supplies are far below current demand and shops are limiting operations to the most essential orders, involving small tonnages. Tanks and pipe requirements are of large proportions but many jobs are being held back until conditions are more favorable.

Olympia, Wash. has awarded contract to American Pipe & Construction Co., Portland, low at $805,133, for 7¾ miles concrete pipe, the job also involving 300 tons plates, bids calling for both concrete and steel pipe for the entire project. Scheumann & Johnson, Seattle, received contracts totaling $496,000 for reservoir and valve house and pump plant. Pittsburgh-Des Moines Steel Co. is low, $59,870, for construction of an elevated steel water tank for Portland.

Philadelphia — Range of plate prices in this district is unchanged, although one producer brought the premium he had been granted under OPA on ordinary tank plate up to $3 to a parity with the premiums which had been allowed two other mills in the district, and which still hold. This producer also brought his export price up to a parity with the other two producers.

Boston — Not until availability of plates eases to a greater extent will the full impact of price decontrol be experienced here. Mill backlogs extend into the second quarter and include substantial tonnages booked at premium prices by four Pennsylvania producers, the balance at base prices. As supply of this product approaches demand, fabricators are likely to resist premium prices. Currently most users will pay premiums to get tonnage, but the spread may narrow or disappear in the months ahead. Selectivity in acceptance of orders also may be subject to competitive pressure. Demand, notably for tank plates, holds at high levels with leads as extended in most cases. Some backlogs are one-sided with light gages. Railroads are asking for more tonnage over the next three months and may require preferred attention to get it. Weldments account for bulk of buying of heavier material.

Steel Bars . . .

Decontrol of prices checks new inquiry slightly as buyers await developments

Bar Prices, Page 144

Chicago—Lifting of OPA ceiling is likely to bring price readjustments for some sizes and grades, but these are expected to be in the form of higher extras than increase in base prices. This is particularly probable for alloys. Producers anticipate heavy carryover into next year, and consequently are using caution in accepting new business. One barmaker, for instance, is taking orders for both carbon and alloy bars only through first quarter. Because of an internal situation, it is taking business on small bars from only one mill through January.

New York—Hot carbon bar sellers are virtually covered for the first quarter on all standard sizes. And much the same is now true, with respect to cold-drawn carbon bars. Only in the alloys, both hot and cold, is the situation fairly easy. Most producers of hot alloy bars can still accept tonnage for January shipment.

The decontrolling of prices has served to check new inquiry for the moment at least, as there is a disposition on the part of various buyers to move slowly until

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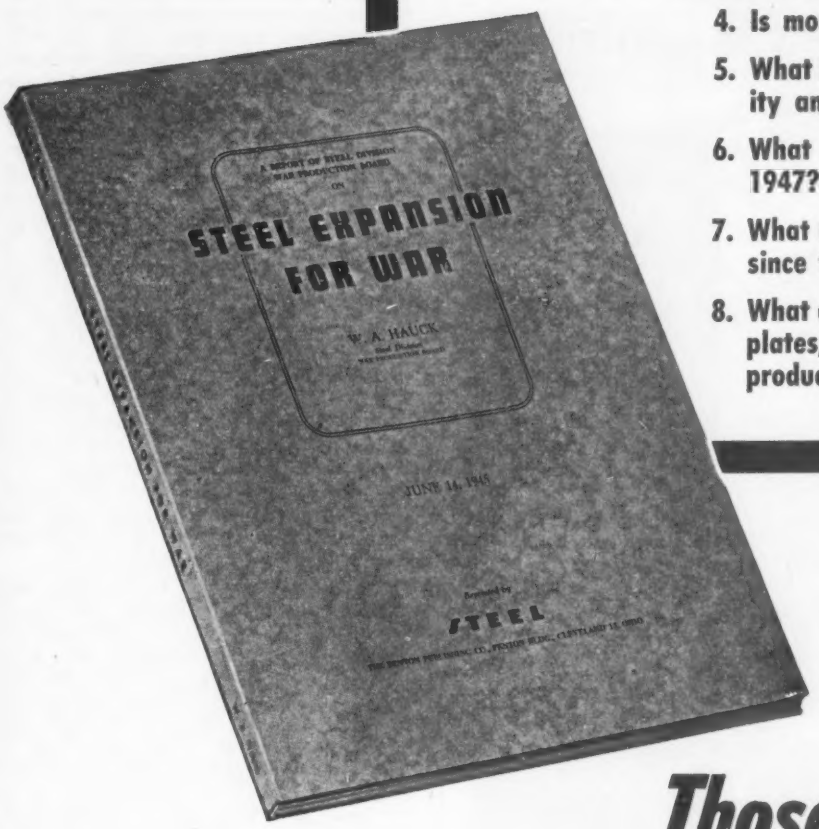

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they can better gage the future trend in prices. However, there is still a lively interest in getting on mill schedules.

Pittsburgh—Alloy steel bar producers do not anticipate any significant upward revision in base prices following OPA decontrol. However, adjustment in extras for some items are probable. Some consideration also is being given to rounding out base price quotations, thus doing away with the fractional cents now in effect as result of the 8.2 per cent increase allowed by OPA last spring. No immediate price action is probable until producers have had an opportunity to see where they stand in regard to price trends of basic raw materials, while the wage question is another major cost factor yet to be decided.

Boston—In carbon steel bars, size is the controlling factor in buying, backlogs and delivery. Over the next two months, lead-time and delivery on both hot and cold-finished should approximate normal in 1¼-inch and larger sizes, inquiry not being brisk in these items. In smaller sizes, notably 1 inch and under, the reverse is true with mills as overloaded as ever. The same position is held by warehouses. Interest still lags in alloy bars, the supply pipelines of which were filled when the war ended and have not been emptied by demand in the meantime. This is particularly true of aircraft quality bars. Banks of parts and bars backed up to billet yards and a considerable tonnage of this alloy material is still available. There also has been some switch back to open-hearth carbon steels by some industries.

St. Louis—Merchant bars remain sold through the first half, though 1947 books are not officially open yet. Deliveries are six months behind schedule and most new orders are being rejected. Concrete reinforcing bars, heretofore reasonably quickly available, are now in tight supply because of raw materials. Scrap is low and car shortages persist. Consumer goods manufacturers continue to press for small bars with limited success. Barmakers foresee little improvement until the labor and wage situation is clarified along with prices.

Seattle—While rolling mills are booking for the first quarter, orders are limited to old customers and caution is being exercised in making commitments in view of the reopening of negotiations for a new wage scale, the present contract expiring in January. Demand for both reinforcing and merchant bars continues unabated. Plants report large backlogs and their first concern is to clean up pending business. No major bookings have been made for 1947.

Wire . . .

Wire Prices, Page 145

Pittsburgh — Better balanced production is anticipated as result of price decontrol, with emphasis probably on increasing output of wire rods for nonintegrated interests, nails and spring wire. Indicated reduction in output of some items, such as wire rope, for example, also will make possible channeling of more steel for other wire items. Warehouse stocks of wire rope are substantial, while considerable war surplus tonnage is still overhanging the market. More balanced geographical distribution of manufacturers' and merchant wire items also prob-

ably will develop following price decontrol. Mills are not scheduling forward commitments accepted on a tentative basis for first-quarter shipment until carryover tonnage can be determined more accurately. On Oct. 23 Pittsburgh Steel Co. was permitted to raise its woven fence (15.5 gage and heavier) prices to 77 per base column.

Chicago—Nails have came to the forefront following lifting of OPA ceilings on steel. For some time, prices have not been adequate and it would not be surprising to have an advance in nails among the first in steel products. An advance might stimulate production and this would be welcome since nails have been in critical shortage in connection with the veterans housing program. There are virtually no stocks of nails. Good weather this fall has been favorable to farm fence building, and this has produced a strong demand and steady pressure for deliveries of both fencing and posts. One district wire maker has opened its books for 1947 business but through first quarter only.

Indianapolis—Special freight rates for carlot shipments of iron and steel wire from Crawfordsville, Ind., to consuming points in Florida are sought in a petition filed with railroads by the Indiana state Chamber of Commerce. The petition asks the railroads voluntarily to reduce charges on the Crawfordsville shipments so that Indiana business can compete with southern industries producing the same items.

Boston—Any increases in wire prices will be made vertically on individual low margin products rather than across the board. Cash increases will probably be first applied on wire products providing low or no margins and on which previous appeals to OPA for relief have been fruitless. Among others this will probably include heading wire. Most mills have allocated most products through first quarter and have considerably unscheduled tonnage on some for the second. Substantial volume which would go into carryovers, overdue orders and delinquent volume has been requested canceled to enable producers to get on firm unclogged monthly basis.

Tubular Goods . . .

Tubular Goods Prices, Page 145

New York — Stringency in merchant pipe continues pronounced, with certain leading producers booked ahead for more than a year on a monthly quota basis. The situation in tubing, including mechanical and boiler tubing, is generally less tight, although deliveries are extended. One large producer is now quoting February to July, depending upon size and grade. Public utility companies have heavy requirements for pipe which they are unable to place and builders who have large housing units and other sizable projects are having considerable difficulty in obtaining shipments.

Boston — Distributors' stocks of merchant steel pipe are kept down by steady demand, bolstered by buyers normally placing direct mill shipments. As a result contractors frequently canvass the entire area to round out tonnage and sizes required. Some mills are not taking direct shipments through jobbers and are sold ahead on these types of orders into third quarter and beyond. Substantial tonnages of steel pipe for

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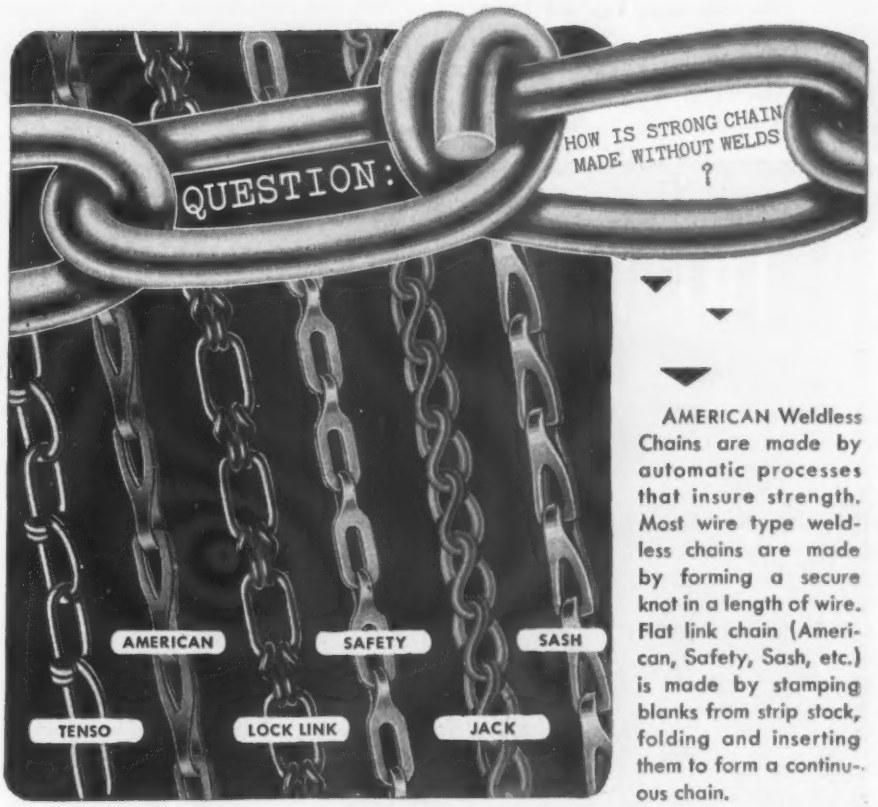

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utilities continue to overhang the market. Industrial buying as well as demand for mechanical and pressure tubing is active. Users of tubing have in some cases changed specifications two and three times to get material, switching from light-walled bedstead tubing to other grades in some instances. One furniture manufacturer has actively bought stainless tubing for railroad car rests and seat trim.

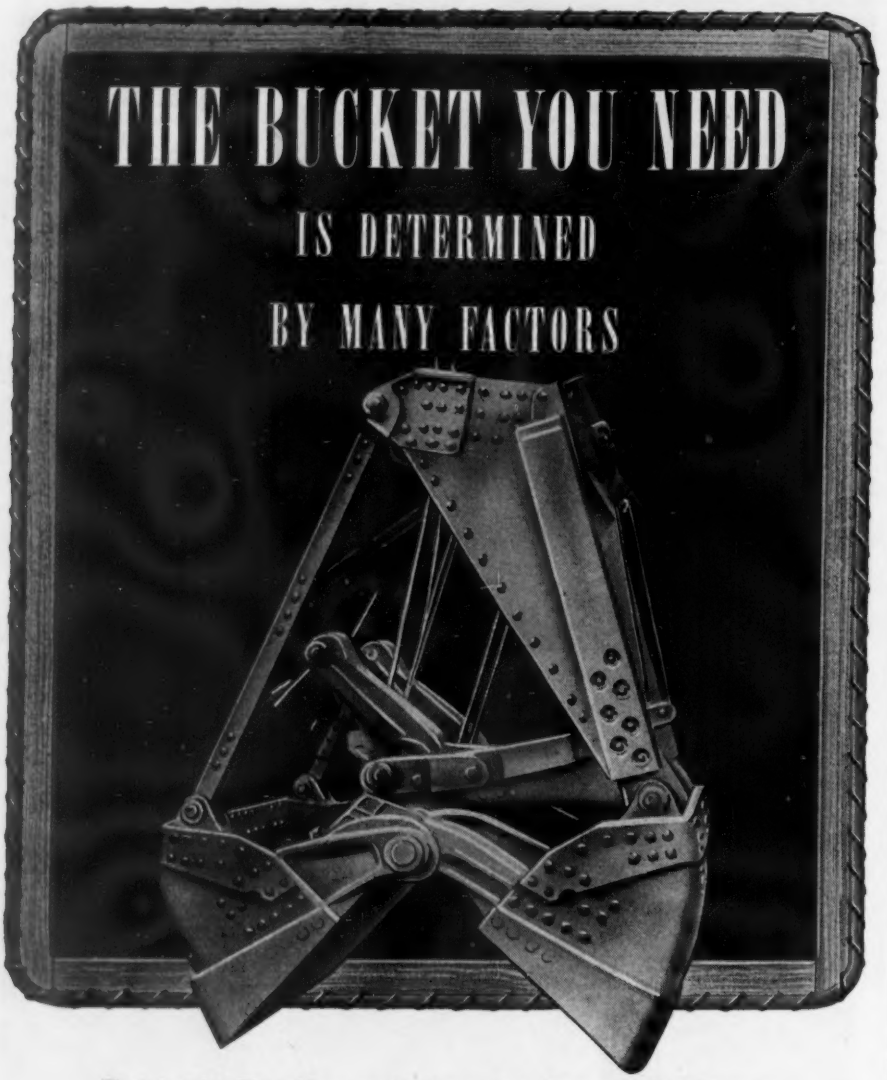
Tin Plate . . .

Tin Plate Prices, Page 145

Pittsburgh—Sellers have opened books for next year shipments at prices in effect at time of shipment. Some time early in December producers are expected to commit themselves on 1947 price level to can manufacturers, who in turn will establish contracts with packers for the entire year. Major uncertainties preventing immediate establishment of 1947 tin plate prices are trends in level of pig tin prices and wage rates. Metals Reserve Corp. is no longer subsidizing pig tin at OPA's ceiling of 52 cents a pound, which means the present price is up 18 cents to 70 cents and it is impossible to accurately guess at this time what the price level likely will be next year.

Box car shortage continues to hamper tin plate production, but producers are hopeful output this quarter will reach the tentative goal of 850,000 tons. There is some prospect government distribution controls will be eased somewhat during first quarter. Export load directive next quarter has not yet been determined, but is expected to be influenced by lag in shipments resulting from Maritime strike.

Chicago—Although tin plate production is at a high level, schedules continue crowded. It is apparent now that year-end carryover will aggregate substantial tonnage. Further, probability is that the first quarter export directive will be heavy. This presents to miscellaneous customers a picture which is not encouraging. One important producer expects to announce tentative quotas for first quarter shortly. Supply of box cars still is critical, but enough cars of other types are being furnished by the carriers so that shipments of finished plate can be maintained.



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Structural Shapes . . .

Geneva, Utah, established as basing point for standard structural shapes

Structural Shape Prices, Page 145

Pittsburgh—Geneva Steel Co. has established a base at Geneva, Utah, for standard structural shapes at $2.50 per 100 pounds. Resumption of shape production at this plant should ease the tight supply situation in east and mid-west somewhat by relieving Carnegie-Illinois Steel Corp.'s mills in this area of West Coast commitments.

Recent CPA construction project approvals include: $183,800, Pennsylvania Railroad; $93,500, American Rolling Mill Co.'s Butler, Pa., plant; $72,946, Crucible Steel Co. of America's Park Works; $61,200, Baltimore & Ohio Railroad; and $60,000, Carnegie-Illinois Steel Corp.'s Irvin Works.

Boston—So heavily loaded are some structural mills on lighter sizes and wide-flanged, not more than 10 per cent of quotas may be specified in four lightweight sections. Overall allocations are also sharply reduced with fabricators forced to round out requirements from warehouse. The latter, in turn, also are calling for more tonnage. Most smaller lot fabricated structural contracts are estimated at warehouse steel costs. Availability of shapes will not be improved if the proposed railroad carbuilding tonnage, about 250,000 tons over the next three months, is channeled to car shops. A substantial part of this is in shapes. This, in addition to some rated volume, part of which comes from new accounts, will cut into allocations further. New inquiry for fabricated material is sagging and some volume is being held up until costs become stabilized.

Philadelphia—Shape prices are unchanged, with all producers who compete in this district quoting 2.35c, Bethlehem, Pa., except one who under OPA was granted permission to quote the equivalent of 2.60c, Bethlehem, on the general range, and 2.70c on beams and channels from 4 to 5 inches and who is continuing to quote these prices. Structural activity continues light with few inquiries or orders reported.

New York — While various jobs are pending, structural activity is still restricted by CPA regulations on nonhousing construction and, moreover, by the

unsettled cost outlook. New work includes about 1425 tons for the subway platform extension work for the New York City Board of Transportation; and 800 tons for the Tischman apartment 71st St., Manhattan. Awards include 750 tons of steel towers for the Civil Aeronautics Administration, Washington, and a similar tonnage for a hospital in Schenectady, N. Y.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 145

New York—About 400 tons of reinforcing steel will be required for the Marcy housing development superstructure in Brooklyn, on which P. J. Carlin Co., 101 Park Ave., Manhattan, has been awarded the general contract by the New York Housing Authority. Reinforcing steel is pending for several sizable housing projects, with action slow because of the difficulty in obtaining steel.

Washington—During the first quarter of 1946 more than 27 per cent of reinforcing bar production was exported, according to the Department of Commerce. Exports continued high during the second quarter, amounting to more than one-fifth of production. Exports during the first five months of 1945 amounted to almost 24 per cent of production compared with less than 5 per cent of production in 1939.

Boston—An increase in reinforcing bar prices is probable. A notoriously low margin product in the past, but still among the first to weaken under shading, reinforcing bars are short because of low production, the result primarily of no profit. For construction and engineering projects, bars are among the tightest products, and lack of reinforcing has delayed some programs. Distributors are unwilling to commit themselves on large tonnages in advance. The larger tonnage projects have therefore been hardest hit as sellers attempted to cover regular customers with small lots, spreading available volume thin. Nearby stocks are limited and where sellers have tonnage obligations to meet, they do so with difficulty. Only a price increase eventually boosting rollings seems the answer. Outstanding new purchase is 1200 tons for the Nut Island sewage plant.

Pig Iron . . .

Immediate price trend uncertain with scrap-iron differential abnormal

Pig Iron Prices, Page 147

Boston—As outlook improves for better supply, starting late this month, conjecture is rife as to pig iron prices in the near future. Normal or prewar differential between iron and scrap prices is currently out of line.

The Mystic furnace is resuming production under a $12 per ton premium subsidy paid by the government over the Everett base price. Any advance in open market base prices would lower the premium by that much with the difference paid by consumers. First shipments from Everett started to foundries late last week with initial production spread thin. Rated tonnage placed with Mystic is not heavy thus far, priorities for housing requirements going largely to furnaces supplying the bulk since August. For November this volume is slightly larger than in October. If still in effect, ratings on the Everett furnace may tend to increase in December-January schedules.

Policy of integrated steelworks producers will weigh heavily, as formerly, on prices. Meanwhile, most melters without ratings have depleted inventories, curtailing the melt in some instances, and the majority of them will not be able to replenish them to safe operating levels much before the start of the new year.

Chicago—For the moment there is no indication that price decontrol will bring changes in pig iron prices. Reason probably lies in the fact that during the past year or so this commodity has been granted relief which gave a price level that is reasonably acceptable to producers. Demand from foundries continues to exceed supply and distributors are forced to adhere to quotas strictly and to keep a close eye on shipping schedules. Inventories are counted only in days. Overall supply of iron has been improved with Inland Steel Co. beginning operation of the newly acquired DPC furnace and at the same time supplying over 20,000 tons of merchant iron per month to the housing program. Shortly the repaired furnace at Granite City, Ill., will resume. Currently, 38 blast furnaces are in operation in the Chicago district.

Youngstown—Shenango Furnace Co. put into blast last week its second blast

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furnace at Sharpsville, Pa. This makes every blast furnace in the Youngstown district in operation for the first time in well over a year. The furnace had been down for several months for relining. Steel plants in the district also are virtually at top capacity with mills unable to raise operations higher. A coal strike would quickly cut operations because of the need for conserving reserves of coal to protect by-product coke ovens.

Cincinnati — Shipments of pig iron, both from northern and southern furnaces, have lagged recently, falling back about one week. Foundries withheld announcements on castings prices, even though faced immediately by high scrap prices. The melters took a stand-by position until declaration of policy by furnaces. Major foundries are on a five-day schedule, and unable to pile reserve iron for winter.

Birmingham—Pig iron scarcity continues. Estimates place the overall shortage at not less than 35 per cent, although the saturation point may not be too far away. Considerable confusion is evident over price decontrol, and no increase in production is expected as a result of that move. No increase in price is expected immediately in this district in view of the subsidy now being paid.

Buffalo—While lifting of controls was expected to boost pig iron prices, one of the leading merchant iron sellers in the district continued to ship against orders on the books at OPA prices. This, however, was not common practice. With consumers pressing for stock, other shipments were made with the understanding that payment will be on the basis of prices to be established. Although higher pig iron prices were anticipated, sellers said it was not apparent in the sustained demand from foundries. Prices, new or old, continued secondary to getting stock. The trade was reluctant to speculate on future price guesses.

Pittsburgh—Most trade authorities expect only a slight advance in pig iron prices in the near future on the basis of present production costs. Everything possible will be done to hold prices at a moderately higher level but this is largely dependent on the extent basic raw materials prices, such as coke, iron ore and scrap can be kept under control. Industry members met in Washington last week to aid in distribution of the certified tonnage during December for the housing program. There is no official indication of how much this tonnage represents in relation to overall output of merchant iron but early estimates place it as generally unchanged from the present volume. In this district, about 50 per cent of the lone merchant stack's output is certified. Those interests sharing in the subsidy payment plan under the housing program are expected to continue shipping at present premium prices regardless of future adjustment of prices for the industry as a whole.

Scrap . . .

Scrap Prices, Page 148

In the first hours of a return to a free market in basic commodities in the metals field, eyes turned to the iron and steel scrap market as an indicator of what might be in store. Most trading except on lists at old prices, which the OPA has requested railroads and other large scrap sources to fill, was suspended as dealers and brokers waited clarification of the price movement.

An inkling of the stand being taken by steel mills was seen in an authoritative report these buyers were seeking retention of OPA formula and differentials on all grades of scrap, along with brokers' commissions and other regulations applying during the period of price control.

Reasoning behind this inclination to prefer some semblance of a controlled price is that it would permit large sources of scrap to continue channeling their tonnage to mills now receiving it, in the knowledge that brokers would go along with the policy.

Beyond this, mills are understood to be considering a token reduction in price of some types of steel, such as alloys and grades carrying a number of extras, with a possible adjustment upward in low-profit or loss types of steel. Feeling seems to be that mills could absorb scrap price increases for 30-45 days in the hope that by that time, price would stabilize at a lower level. The adverse effect on labor sentiment of higher steel prices was being given careful consideration.

Detroit—On basis of mill offers the scrap market here is up $5 per ton on openhearth grades, bringing the price to $22.32 per ton, with 50-cent broker commissions continuing. Essentially this amounts to an advance of only $2.50, since under former upgrading practices open-hearth material was being sold

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as plate scrap or electric furnace grades at a price of $19.82. The latter is now advanced $2.50 per ton to make it the same price as open-hearth grades. Borings and turnings are advanced $2.50 per ton on the basis of bids.

Shipments are definitely going ahead on these new prices. Brokers are offering $5 a ton more for low-phos plate, or $24.82 but are finding no material. It appears logical that if open-hearth grades are marked up $2.50 over the former price of plate, then the latter, to maintain the usual differential, will have to be advanced $5.

Buffalo — Early meager sales in a highly confused scrap market indicate prices will range anywhere from $2 to $5 above OPA ceilings. Such increases were not over levels of recent sales because No. 2 heavy melting and bundles have been moving at the low phos price of $2.50 over ceiling. The entire market is in a state of flux. Consumers generally placed new prices at $2.50 above OPA levels while dealers went as high as $5 to $10, and indicated they would bid higher.

Cincinnati—Iron and steel scrap market presented an unsettled condition immediately following removal of controls. Melting steel was lifted $5 on mill buying policy. Foundry scrap also took a $5 rise, although willingness by some melters to pay long hauls indicated cast may be pushed still higher. Supplies continued tight.

Birmingham — Decontrol has brought about the most confused condition yet evident in this district's scrap market. A general and tentative increase of $2.50 a ton on heavy melting was noted, but scrap interests declare there is little significance in that figure since the effect of decontrol thus far has been to further tighten the supply with a view to see what happens. Most observers expect little clarification of the general situation until later this week. Most dealers declare they are especially interested in shying away from speculative transactions.

Philadelphia — While steel scrap prices are $5 a ton above recent OPA levels, the increase since the lifting of government ceilings is, in practical effect, around $2.50. This is explained by the general upgrading of scrap over recent weeks whereby much melting steel was moved at a low phos premium of $2.50.

Cast grades have registered still sharper gains, with $35 delivered, having been paid by consumers and with some sellers holding out for as high as $40. Scrap has not been moving freely, as there is much resistance on the part of sellers, who expect still higher levels. Some grades have moved in such small volume as to make price appraisal almost out of the question. In fact, the entire market is in a highly unsettled state but with a strong price undertone.

Lifting of OPA restrictions will result in stronger competition from the steel mills for cast scrap. Heretofore, these consumers were not permitted to purchase cupola cast. Now, however, they can do so, if they care to pay the premium. This means that foundries will have less material to draw upon.

Certain classifications set up under OPA are expected to disappear as time goes on, including those in cut structural and plate scrap. Certain old classifications may reappear. Brokers and dealers will include commissions in delivered prices instead of adding them to the delivered prices as has been necessary under OPA regulations.

Chicago — Open hearth scrap sold here last week at $23.75, an advance of $5 over former ceiling prices, while blast furnace material advanced $2.50. Several consumers took heavy melting and bundles freely at the higher prices. Of the $5 advance, $2.50 is more or less regarded as a premium for low phos and presumably could be withdrawn if shipments fail to meet specifications. Time will be required to gage the volume which has been held back recently in the hope of higher prices and how much will continue to be held back in hope of still higher prices. Despite general confusion, activity has expanded considerably.

Cleveland — Open-hearth grades of scrap advanced $5 a ton here last week to the basis of $24.50 a ton for No. 1 heavy melting steel while blast furnace grades rose $2.50 a ton to the basis of $17 for machine shop turnings. Large consumers and brokers were attempting to establish the market at a "fair" price level and enjoyed an encouraging amount of success in this direction. In grades where the buyers are bidding prices up actively the price advance was much sharper with No. 1 cupola cast quoted $30 to $35 a ton compared with the OPA ceiling of $25.

Pittsburgh — Leading consumers placed new scrap orders last week at $5 a gross ton above former OPA ceilings for steelmaking grades, while turnings and cast scrap were bought at $2.50

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and $2, respectively, above former ceilings. No sales on electric furnace and railroad grades were reported up until mid-week but prices were considered nominal at a $5 advance above former ceilings. Producers are going to be insistent on accepting only that quality scrap specified and are hopeful that upgrading abuses will be stopped. The entire scrap price structure was confused, although it is believed mills are determined to do everything possible to prevent a drastic splurge in prices. If prices do not get out of hand, a much more thorough plan of obtaining scrap directly from mill customers in the form of tie-in sales will be pushed. Higher scrap prices have released considerable tonnage held back by dealers and to a lesser extent metal working plants, and it is hoped that the advance will encourage collection of scrap from remote areas.

One of largest consumers of cast scrap here purchased a substantial tonnage last week at $2 above former price ceilings, thereby at least temporarily establishing a price level for this material. However, there were unconfirmed reports of higher offerings made in this area.

Due to unsettled scrap price structure the Southern Railway System has postponed opening bids on its scrap list, scheduled for Nov. 13 to Nov. 21. Bidding against Pennsylvania railroad's list, to be opened Nov. 17, may give some indication of probable scrap price level for near future. However, there has been a dearth of open hearth grades on railroad lists in recent months, with carriers allocating much of their material.

Warehouse . . .

Warehouse Prices, Page 146

Pittsburgh — Serious consideration is being given the re-establishment of the normal relationship between steel mill and warehouse prices. The spread between warehouse and mill prices was narrowed during the war, particularly on bars, small shapes, plates and sheets as result of OPA refusing distributors permission to pass on some mill price advances. Distributors note very little increase in pressure for steel resulting from price decontrols, and add that it wouldn't make much difference for stocks are so depleted and distribution is being carefully allocated. Warehouse interests state some customers have been forced to reduce production schedules because of inability to get necessary steel requirements, even though they are willing to accept substitute specifications.

Boston — Warehouses are getting slightly less steel this quarter, although tonnagewise the loss is not great. The pinch comes in the type of product, sizes and grades received. Items in greatest demand are short in wanted sizes, including flat-rolled small bars, bar angles and shapes, wire products and light shapes. On the other hand stocks are building up on slower moving products, including alloys and large size round carbon bars. The demand for steel out of warehouses holds high with more buyers than usual seeking to fill requirements from stock. This is expected to continue until mill deliveries improve on these products. Any mill advances are expected to be followed by warehouses.

Copper, Lead, Zinc and Tin Prices Advance Following Decontrol Order

NEW YORK—Prices of several major metals advanced last week following removal of price controls. Various other government controls remain in effect, however.

For the present priority and allocation controls over copper, tin, lead and zinc will be continued. Licenses must still be obtained for the private importation and exportation of the principal metals. Foreign copper and lead owned by the government are allocated. In addition, lead is subject to a set-aside, amounting to 25 per cent of domestic production, for emergency use. Controls will be revised in some instances and 45 orders now in effect will be reduced by the Civilian Production Administration to 30.

Office of Metals Reserve contracts will not be greatly affected. In the case of metals which were under controls, sales will be made at the old OPA ceilings on date of shipment, but where no ceilings hold, sales will be made at published market quotations. Other metals affected by this include aluminum, cadmium, antimony, and platinum.

Copper—Leading producers increased the price of copper to the basis of 17.50c, delivered Connecticut Valley, for electrolytic. This is an advance of 3.12½ cents over the old OPA ceiling. The new price was effective Nov. 12. This places the new price for primary copper at approximately the world market level.

Brass and bronze ingot prices advanced 2½ to 4¼ cents a pound to the carlot basis of 19.00c for 85-5-5-5, 22.50c for 80-10-10, 2.75c for 88-10-2, and 15.00c for No. 1 yellow ingot.

Brass mill product prices advanced to the 17.50-cent basis for electrolytic. Copper sheets are now quoted 28.93c while yellow brass sheets are quoted 26.17c. Extras for quantities under 2000 pounds are increased with progressively larger increases for smaller quantities.

Lead—Prices advanced to the basis of 10.35c a pound, East St. Louis, and 10.50c, New York, effective Nov. 11. This represented an advance of 2.25c a pound. Full lead sheets advanced to 13.60c from 11.25c while cut sheets advanced to 14.10c from 11.50c. Lead pipe prices rose to 12.85c, fob manufacturing plant from 9.90c while lead traps and bends, previously quoted 10 per cent off list, are now list plus 20 per cent.

Zinc—Slab zinc prices advanced 1.25 cents a pound to the basis of 10.50c, East St. Louis, for prime western. Usual premiums in other grades were maintained. When duty is taken into consideration, the new price for zinc is still below the world market level but may be high enough to attract more foreign zinc or slabs to contribute toward reducing the deficit in domestic production.

Rolled zinc products also advanced 1.25 cents. Zinc dust advanced a like amount to the basis of 12.50c, delivered in carlots.

Tin—Price of grade "A" tin recovered from scrap advanced 18 cents to the basis of 70.00c a pound, New York. This move was followed by the entire market. Although detinning plants were responsible for the sharp rise, they account for only about 5 per cent of current deliveries of primary metal, the balance coming from government holdings. Some revision in the Office of Metals Reserve selling price is likely.

Aluminum—Indications are that the price of aluminum will not be raised as a result of the general decontrol program, although some adjustments may be necessary later if cost factors change. Aluminum has not been under OPA control and primary ingots are still quoted on the basis of 15c a pound, delivered. The competitive position of aluminum likely will be strengthened as the result of price advances in other metals, such as copper, lead and zinc.

Rails, Cars . . .

Track Material Prices, Page 145

New York—While several lists are being figured, car builders report difficulty in seeing their way ahead on raw materials, especially steel. Most leading producers of car steel are already solidly booked ahead throughout the first quarter and even beyond in some cases.

However, some sizable work is being entered, including 750 fifty-ton box cars for the Boston & Maine, placed with Pullman-Standard Car Mfg. Co., Chicago, for

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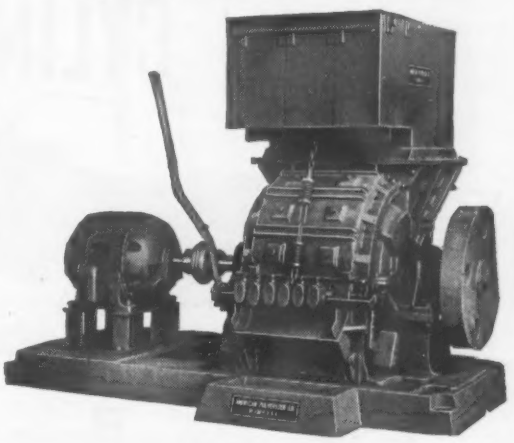

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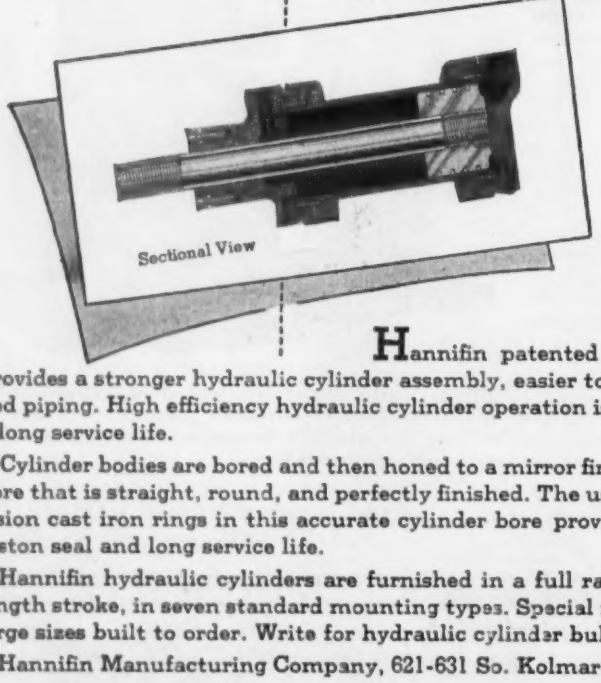

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likely erection at Butler, Pa. Two hundred and fifty 50-ton box cars for the Atchison, Topeka & Santa Fe have also been placed with this builder.

Meanwhile, question of priorities for car steel is still pending. It is understood a meeting will be held in Washington Nov. 18, a postponement of the meeting originally scheduled for Nov. 14, to further discuss the matter of car steel preferences. Car builders generally are opposed to any broad system of ratings, since it might be at the expense of programs already under way. They believe that given a little more time they will be able to work out their problems and that general car requirements will suffer but little in the long run. The attitude of at least some car builders is that if any additional ratings are to be granted, they be for car repairs in railroad company shops.

A leading rail award involves about 120,000 tons for the New York Central, placed with the Carnegie-Illinois Steel Corp., Pittsburgh; Bethlehem Steel Co., Bethlehem, Pa.; Inland Steel Co., Chicago; and the Algoma Steel Corp., Saulte Ste. Marie, Ont., Canada. The distribution, it is said, was made along the same lines of other recent years, with the major portion going to Carnegie-Illinois and Bethlehem. Accessories are also being placed, estimated tonnagewise as around 20 per cent of the rail tonnages.

Domestic freight car orders in October involve 3417 units, bringing the total for the first ten months up to 59,552, according to the American Railway Car Institute. Unfilled orders at the end of October amounted to 45,527 freight cars.

Domestic freight cars delivered last month totaled 3828, against 4016 in September, and brought the total for the first 10 months up to 35,537.

Freight car award comparisons follow:

	*1946	1945	1944	1943
Jan.	2,050	7,200	1,020	8,365
Feb.	2,403	1,750	18,240	350
March	4,516	2,500	6,510	1,935
April	3,764	1,120	4,519	1,000
May	3,025	1,526	1,952	870
June	3,334	670	1,150	50
July	15,236	3,500	795	4,190
Aug.	9,530	7,240	3,900	8,747
Sept.	12,737	12,840	400	6,820
Oct.	3,417	1,320	2,425	5,258
Nov.	....	1,650	1,065	870
Dec.	....	4,116	16,245	2,919
Total	....	45,432	53,221	41,355

* American Railway Car Institute.

Semifinished Steel . . .

Semifinished Prices, Page 144

Pittsburgh—Cessation of price controls is expected to make possible increased production of wire rods, billets, sheet bars, etc., for nonintegrated interests. These items have been in extremely tight supply primarily because it was more profitable for integrated steel producers to convert as much as possible of their semifinished steel output to finished items. On Oct. 23, Pittsburgh Steel Co. was granted permission by OPA to raise its price $7 a ton on wire rods No. 5—$\frac{9}{32}$-in., inclusive, or up to $2.65 per 100 pounds; over $\frac{9}{32}$-in., $11 a ton or to $3 per 100 pounds. This interest will continue to sell wire rods at above quotations and does not plan to raise prices further in the near future despite OPA decontrol. Follansbee Steel Corp. is no

longer taking orders for forging quality billets and plans to remain out of this market indefinitely.

Alloy Spring Steel Flats Extras Raised by Inland

Effective with shipments of Nov. 4 and later, Inland Steel Co., Chicago, has increased the extras for chemistry on alloy spring steel flats for automobile springs. This action was taken prior to the general removal of price controls.

For AISI 5150, the new extra is 35c per 100 pounds, compared with the former 15c; for AISI 5152, 45c compared with 15c; and on AISI 9262, 65c compared with 40c. New price on AISI 5150, for example, is computed at 2.70c base, plus 0.35c for chemistry, plus alloy card of extras, plus 8.2 per cent of total of these three items. This reflects no change in price for purposes other than alloy automobile springs.

Geneva, Utah, Named Basin Point on Structural Shapes

Geneva Steel Co. established as of Nov. 12 Geneva, Utah, as a basing point on its sales of standard structural shapes within the range of sizes, grades, finishes and specifications currently produced at Geneva.

Delivered price Geneva, Utah, for standard structural shapes is $2.525 per 100 pounds in carload lots.

Prices are subject to seller's current list of extras, standard conditions of sale, and are subject to changes without notice. Shipments will be invoiced at prices and extras in effect at time of shipment.

This is the second Geneva basing point to be established in recent weeks. On Oct. 15 announcement was made that price for sheared plates delivered Geneva would be $2.675 per 100 pounds in carload lots.

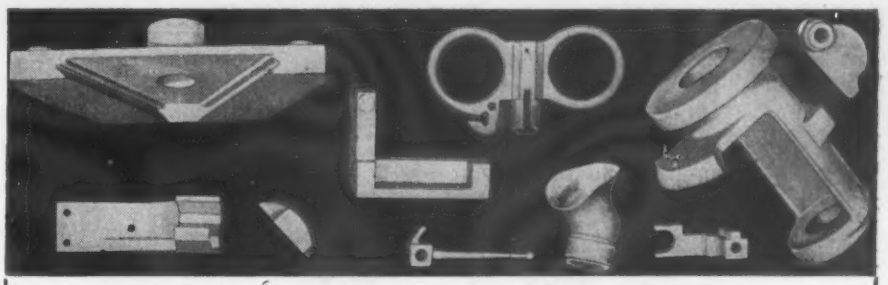
Standards for Light Gage Structural Steel Issued

New official industry standards for light gage steel which will make possible broader uses of the material in certain types of building construction, have just been announced by the American Iron & Steel Institute.

The comprehensive "Specification for the Design of Light Gage Steel Structural Members," issued by the institute, is the result of studies begun in 1939 under its Building Code Committee.

According to B. L. Wood, consulting engineer of the committee, research work has been carried on intensively and continuously at Cornell University for more than seven years, under the direction of Dean S. C. Hollister of the College of Engineering, Professor W. L. Malcolm, director of the School of Civil Engineering and Dr. George Winter, associate professor of Civil Engineering, in immediate charge of research.

The program has had as its objective



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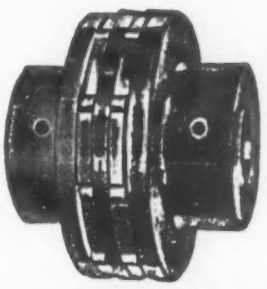

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STRUCTURAL SHAPES . . .

STRUCTURALS PLACED

1450 tons, rolling building, Kokomo, Ind., for Haynes Stellite Co., to Bethlehem Steel Co., Bethlehem, Pa.

750 tons, hospital, Schenectady, N. Y., to Harris Structural Steel Co., New York City.

450 tons, foundry building, Springfield, O., for National Supply Co., to Midland Structural Steel Co., Cicero, Ill.; Esch Construction Co., Cleveland, contractor; bids Oct. 21. Reported in error last week as Springfield, Ill.

415 tons, sheet piling, dock wall, Kenosha, Wis., for Simmons Co., to Carnegie-Illinois Steel Corp.; Edward E. Gillen Co., Milwaukee, contractor.

400 tons, sheet piling, dock wall, Milwaukee, for Callum Tanning Co., to Carnegie-Illinois Steel Corp., Chicago.

373 tons, additional material for blast furnace reconstruction, South Chicago, Ill., for Carnegie-Illinois Steel Corp., to American Bridge Co., Pittsburgh.

300 tons, buildings 78 and 82, Laporte, Ind., for Allis-Chalmers Mfg. Co., to American Bridge Co., Pittsburgh; bids May 20.

268 tons, construction, Duluth, for American Steel & Wire Co., to American Bridge Co., Pittsburgh.

200 tons, additions to plant of Puget Sound Pulp & Timber Co., Bellingham, Wash., to Isaacson Iron Works, Seattle.

STRUCTURAL STEEL PENDING

4500 tons, superstructure, South Capitol street bridge, Washington, Phoenix Bridge Co., Phoenixville, Pa., low, $2,123,354, bids Oct. 31.

1425 tons, transmission towers, Milwaukee, for Wisconsin Electric Power Co.

605 tons, four highway overpasses, Rutherford, N. J.; bids Dec. 3; Spencer Miller Jr., state highway commissioner, Trenton, N. J.

500 tons, Wiese Ave. bridge, Baltimore, Md., McLain Contracting Co., Baltimore, low on general contract.

800 tons, Tischman apartment, 71st St., New York, bids asked.

750 tons, subway platform extension, Manhattan, bids to be opened Nov. 26 by the New York City Board of Transportation.

750 tons, steel towers Civil Aeronautics Administration, Washington, to Lehigh Structural Steel Co., Allentown, Pa.

700 tons, car fabricating shop, DeSoto, Mo., for Missouri Pacific railroad.

675 tons, subway platform extension, Culver Line, bids to be opened Nov. 29, by New York City Board of Transportation.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1500 tons, Zellerbach paper mill addition, West Linn, Oreg., to Bethlehem Pacific Steel Co., Portland, Oreg.

1200 tons, Nut Island Sewage plant, Boston, to Bethlehem Steel Co., Bethlehem, Pa., through Barletta Construction Co., Roslindale, Mass.

150 tons, school, Hamilton, Mass., to Truscon Steel Co., Youngstown, O., through Maconber Construction Co., Boston.

REINFORCING BARS PENDING

4000 tons, superstructure, Marcy housing development, general contract awarded by the New York City Housing Authority, to the P. J. Carlin Co., 101 Park Avenue.

200 tons, E. 34th St. bridge, Tacoma, Wash.; general contract to Guy F. Atkinson Co., Seattle.

160 tons, addition, Michigan City, Ind., for Indiana State Prison; bids Nov. 15.

Unstated, women's residence hall, Urbana, Ill., for University of Illinois; bids Dec. 6.

Unstated, 80-foot box girder bridge, Yakima county, Washington; bids Nov. 20.

Unstated, 7.75 miles concrete water pipe for Olympia, Wash., awarded to American Pipe & Construction Co., Portland.

PLATES . . .

PLATES PLACED

807 tons, naval gun factory, Washington, to Lukens Steel Co., Coatesville, Pa., delivery March to April; Alan Wood Steel Co., awarded 85 tons floor plates, delivery 160 days.

300 tons, 36-inch water pipe line for Olympia, Wash., to American Pipe & Construction Co., Portland.

100 tons or more, welded steel plate penstock, Bureau of Reclamation, Denver, to Darby Products of Steel Plate Corp., Kansas City, Kans., $732,756.

PLATES PENDING

Unstated, ½-million gallon tank, Portland, Oreg.; Pittsburgh-Des Moines Steel Co., low, $59,870.

Unstated, two steel water tanks for Oak Ridge Lodge water district, Portland, Oreg.; Rushlight Auto Sprinkler Co., Portland, low, $17,100.

PIPE . . .

CAST IRON PIPE PLACED

1000 tons, 12-inch pipe, Idlewild Airport, New York, U. S. Pipe & Foundry Co., Burlington, N. J.

900 tons, 12-inch pipe, submarine line under Boston harbor, Massachusetts district commission, to U. S. Pipe & Foundry Co., Burlington, N. J.

CAST IRON PIPE PENDING

1900 tons, Tacoma, Wash., bids in; award pending.

750 tons, 16-inch pipe, Springfield, Mass.

525 tons, 6 and 12-inch pipe, city of Boston.

100 tons, Seattle system expansion; bids in; award pending.

Unstated, Oak Lodge water district, Portland; Rushlight Sprinkler Co., low, $113,399.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Atchison, Topeka & Santa Fe, ten 6000-horsepower Diesel-electric locomotives, six going to the Electro Motive Division, General Motors Corp., La Grange, Ill., and four to the American Locomotive Co., New York.

RAILROAD CARS PLACED

New York Central, approximately 120,000 tons, to Carnegie-Illinois Steel Corp., Pittsburgh; Bethlehem Steel Co., Bethlehem, Pa.; Inland Steel Co., Chicago; and Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., Canada.

RAILROAD CARS PENDING

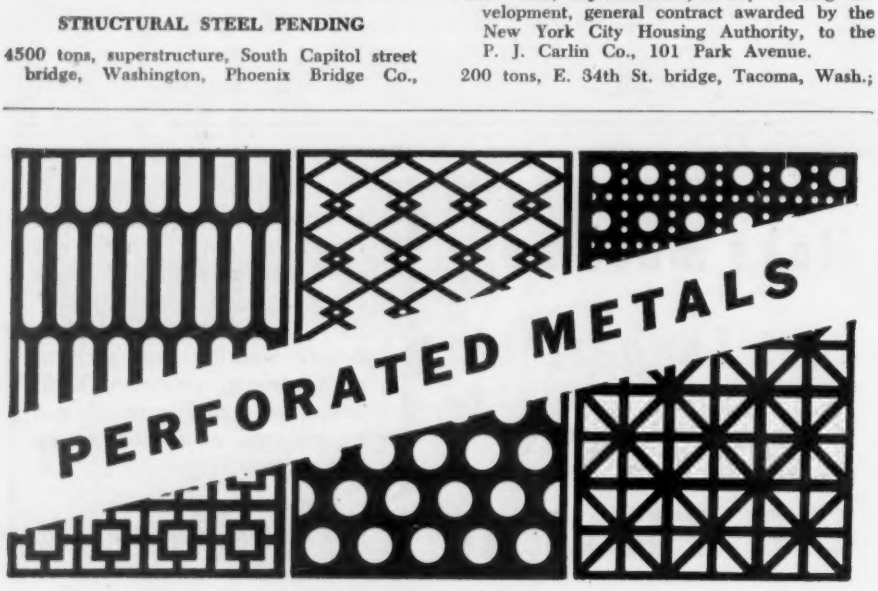
Navy, Bureau of Supplies and Accounts, 380 tons for Norfolk, Carnegie-Illinois Steel Corp., Pittsburgh, only bidder.

RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 250 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Boston & Maine, 550 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

The Reading, 1000 fifty-ton steel box cars, to its own shops, Reading, Pa.; this list was erroneously referred to in last week's issue as involving 1000 hopper cars; 25 steel caboose cars also will be built at Reading.



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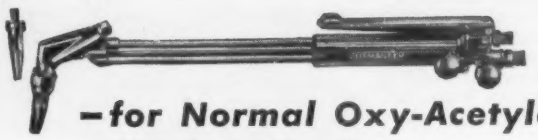

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CONSTRUCTION AND ENTERPRISE

ALABAMA

MOBILE, ALA.—Col. Mark M. Boatner Jr., Mobile District Army engineer, has outlined tentative plans for developing the Apalachicola river system in Alabama, Florida and Georgia, at an estimated cost of $80 million. Program includes construction of four sets of locks and dams and three hydroelectric power plants, having capacities of 27,000 kw, 88,000 kw and 28,900 kw, respectively.

ARIZONA

TUCSON, ARIZ.—Tucson Iron Works has received CPA approval for construction of a new plant to be erected by McCoy Construction Co., at a cost of $40,000.

CALIFORNIA

LOS ANGELES—Diamond Machine Tool Co. has obtained CPA approval for construction of a factory addition at 3429 E. Olympic Blvd., to be 116 x 91 feet and to cost $30,000.

GEORGIA

AUGUSTA, GA.—Babcock & Wilcox Co., Refractories Division, Old Savannah Rd., has received CPA approval for construction of a refractory products manufacturing plant to cost $50,000.

PORT WENTWORTH, GA.—Southern Paperboard Corp., subsidiary of Robert Gair Inc., New York, has begun construction of an $11 million plant. J. E. Sirrine & Co., Greenville, S. C. is the engineer; Daniel Construction Co., Greenville, is the contractor.

ILLINOIS

EAST ST. LOUIS, ILL.—Southwestern Bell Telephone Co., 1010 Pine St., St. Louis, has awarded general contract for five-story building at Eighth St. and Missouri Ave. to Gamble Construction Co., 904 Pine St., St. Louis. Cost of building will be about $600,000, exclusive of equipment. Total cost is expected to be approximately $2 million.

INDIANA

CLINTON, IND.—Clinton Machine Tool Co. has been formed with 2000 shares of $100 par value capital stock to manufacture machine tools by Merritt C. Walker, S. Muriel Walker and Fred R. Walker.

MICHIGAN

DEARBORN, MICH.—H. P. Owens Inc., 20443 Van Born Rd., has been formed by Hugh P. Owens, 18135 Fielding Ave., Detroit, to manufacture metal castings. The company was formed with 120 shares of no par value stock.

DETROIT—Plymouth Division, Chrysler Corp., has received CPA approval for construction of a $46,720 paint reclaiming building.

DETROIT—American Metal Products Co. has CPA approval for construction of $40,000 fire damage repair project.

DETROIT—Perma-Tite Lock Nut Corp., 1601 Stroh Bldg., has been organized with $50,000 capital to manufacture bolts, nuts and allied items by Orland R. Wysong, 16745 Sunderland Ave.

DETROIT—United Pressed Steel Co., 424 Superior St., has been formed with $75,000 capital to manufacture metal furniture and other metal products by Jack Lipschutz, 18619 Santa Rosa Drive.

DETROIT—Clinch Nut Mfg. Co., 1963 National Bank Bldg., has been organized to manufacture nuts and stampings by E. T. Broadwell, same address. The company has $50,000 capital.

DETROIT—Clark E. Gordon Inc., 2-265 General Motors Bldg., has been formed to design and build corrosion resistant equipment for pickling and plating by Clark E. Gordon, 20240 Litchfield Rd. It is capitalized at $20,000.

DETROIT—Martin Foundries Co., 1401 S. Schaefer Highway, has been organized with 300,000 shares no par value to operate metal foundries by Jack Eder, 2615 Webb Ave.

DETROIT—All American Trailer Co. Inc., 10640 Gratiot Ave., has been formed with $60,000 capital to manufacture trailers, parts and accessories by Harlie H. Kugler, same address.

FLINT, MICH.—Da Sacco Brothers Inc., River Rouge, Mich., has been awarded contract for local warehouse for AC Spark Plug Division, General Motors Corp., Detroit.

FLINT, MICH.—B & G Mfg. Co., 2026 Beach St., has been organized with $100,000 capital to engage in a machine tool and manufacturing business, by Donald L. Brock, 7396 Brockway Av., Mt. Morris, Mich.

GRAND RAPIDS, MICH.—Cadillac Cutter Co., 1555 Eastern Ave. S. E., has been organized with $50,000 capital to manufacture machine tools by J. M. Gould, 525 Griggs Ave.

KALAMAZOO, MICH.—Kalamazoo Foundry & Machine Co. has completed plans for construction of a $75,000 addition.

KALAMAZOO, MICH.—Aero-Motive Mfg. Co., 1803 Alcott St., has been organized by Rodger F. Becker, same address, to manufacture mechanical and electrical devices. Company is capitalized at $100,000.

LANSING, MICH.—Ace Mfg. Co., 722 South Foster, has been organized with $50,000 capital to manufacture dies, tools, fixtures and parts by Harold W. Williams, 2205 South Pennsylvania Ave.

MARYSVILLE, MICH.—CPA has approved construction of a factory addition, to cost $46,000, for Pressed Metals of America Inc.

MUSKEGON HEIGHTS, MICH.—Alcasco Products Inc., 1200 Eighth St., has been formed to make metal window sash and casements by Theodore M. Mroozka, 805 Eighth St. It is capitalized at $50,000.

VAN DYKE, MICH.—Anchor Tool & Die Co., 4031 East Eight-Mile Rd., has been formed to manufacture tools, dies, gages and allied products by Lee B. Keller, 5710 Williamson Ave., Dearborn, Mich. It is capitalized at $50,000.

MISSOURI

HANNIBAL, MO.—City of Hannibal has awarded approximately $600,000 in contracts for furnishing and installing additional equipment in the municipal light and power plant. Contract for a 10,000 kw steam turbogenerator unit went to Westinghouse Electric Co., Pittsburgh, at $310,000. Elliott Co., Jeannette, Pa., will furnish and install a 14,000 square-foot surface condenser unit and auxiliaries for $69,000, and General Electric Co., Schenectady, N. Y., received a contract for about $223,629 to provide switchgear equipment and transformers. No bids were received on the construction and completion of building additions to house the new equipment.

JEFFERSON CITY, MO.—Propane Inc., has been formed by E. B. Buell and associates to manufacture, refine, smelt and deal in gas, gas tanks, liquefied fuels, tar, oils, etc.

ST. LOUIS—Advance Oven Co., 700 South

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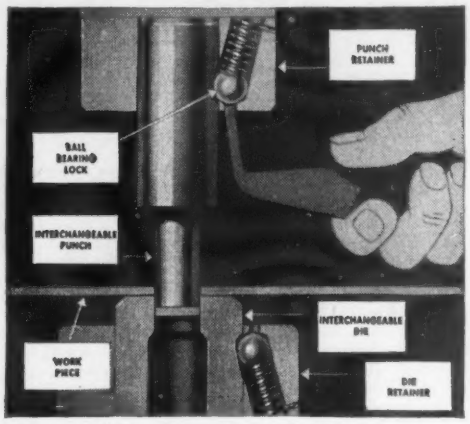

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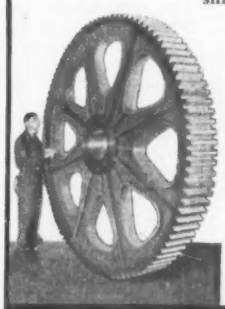

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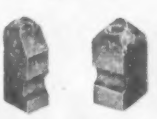

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18th St., has awarded general contract for one-story, 100 x 160-foot factory at 4507 North Broadway to S. W. Drake, 3820 North Broadway. Plans and specifications were prepared by H. Julian Vernon, engineer, 3407½ South Jefferson Ave.

ST. LOUIS—Monsanto Chemical Co., 1700 S. Second St., has let contract to Fruin-Colnon Contracting Co., 1706 Olive St., for three plant additions at 2021 Kosciusko, to cost $40,000; at 137 W. Russell, to cost $47,000; and at 153 W. Russell, to cost approximately $32,000.

OHIO

AKRON—Colonial Insulator Co., 973 Grant St., is planning to spend about $12,000 on an addition and alterations to its present plant.

AKRON—Saalfield Publishing Co. is planning a $500,000 expansion program. The company expects construction to start next year on a 90,000 square-foot plant addition.

AKRON—Fred Marvin & Associates Inc., 577 Grant St., manufacturer of hardware and agricultural items, recently formed, is purchasing new equipment and machinery and will begin production soon of a new type fruit picker.

ALLIANCE, O.—Alliance Tool Co., 1210 W. State St., has been changed from an individual proprietorship to a corporation by Fred W. Mehl, former owner, and now president. The company, which manufactures tools, dies and special carbide tools, is enlarging its plant and will install new equipment and machinery.

CANTON, O.—Babcock Printing Press Corp., New London, Conn., which recently purchased from WAA the plant on Waynesburg Rd. S. E., formerly occupied by Dayton Malleable Iron Co., anticipates that production on a small scale at the new plant will start within 90 days. The company expects to employ between 800 and 1200 persons when peak production is reached.

CANTON, O.—Winters Foundry & Machine Co. will begin construction soon of a one-story building on Louisville Rd. The company is vacating its present building at 1733 Olive Pl. N. E., which was recently acquired by Union Metal Mfg. Co., 1432 Maple Ave. N. E. The new building, which contains 25,000 square feet of floor space, will cost about $60,000.

CLEVELAND—Eagle Wire Works, 3817 Woodland Ave., has taken over a storeroom at 3809 Woodland where it will install heavy straightening machinery. Joseph S. Malik is owner.

CLEVELAND—Midland Steel Products Co., W. 106th St. and Madison Ave., is planning construction of a factory to be used for manufacture of auto frames. Cost will be about $175,000.

CLEVELAND—Webber Co., 1609 E. 25th St., will spend about $50,000 to rebuild a mill carpenter shop and storage building at 2342 Franklin Ave., recently destroyed by fire. Probably equipment will be replaced.

GIRARD, O.—Hetz Industrial Supply Co. Inc., has been formed with 500 shares of no par value stock to manufacture industrial tools and machinery and mechanical and industrial rubber goods. Incorporators are Virgil Moore, Martha Jane and Russell R. Hetz, 2 S. Main St., Niles, O.

NEWTON FALLS, O.—Fox-Burch Products, manufacturer of small engine lathe, turret lathe and milling machine products, was recently incorporated. It has previously operated as a partnership. Plant expansion is considered likely in the future.

SALEM, O.—Electric Furnace Co., W. Wilson St., has begun construction of a 3600 square-foot addition to office and engineering space.

SALEM, O.—Lincoln Machine Co., N. Lincoln Ave. and E. Fifth St., has construction under way on a new plant between N. Howard and Jennings avenues and Second and Third streets. The new plant will contain approximately 15,000 square feet of floor space.

OREGON

MEDFORD, OREG.—Southern Oregon Sales Co. Inc. is receiving bids for refrigeration machinery and equipment, costing $30,000, for installation in a $54,000 plant addition. S. M. Pattle is general manager.

PORTLAND, OREG.—Texas Co., 3640 N. W. St. Helens Rd., has awarded contract for construction of fire wall and oil tank foundations to cost an estimated $35,000 to Reimers & Jolivette.

TEXAS

BAYTOWN, TEX.—General Tire & Rubber Co. has let contract for $240,000 to Tellepsen Construction Co., 3900 Clay Ave., Houston, Tex., for construction of additions to carbon black plant. Lockwood & Andrews are consulting engineers.

CORPUS CHRISTI, TEX.—E. L. Caldwell, 117 N. Chaparral St., has let contract to J. W. Bermingham, 1809½ Morgan St., for construction of a farm equipment manufacturing plant at 3210 Agnes St., to cost $25,000.

HOUSTON, TEX.—Gulf Portland Cement Co. is planning a $1 million expansion program at its plant on the north side of the Houston ship canal near the Clinton docks. Equipment to be used will be moved from the recently acquired sinter plant at Mobile, Ala.

HOUSTON, TEX.—Corn Products Refining Co., W. T. Brady, assistant, is contemplating construction of a $10 million refinery for manufacture of sugar, syrups and high-protein feed from grain sorghum.

WASHINGTON

LONGVIEW, WASH.—Cowlitz county public utility department has called bids Dec. 2 for reconstruction of steam plant, estimated at $200,000, converting from hog fuel to oil and installing cooling system and other new equipment. H. W. Beecher, Seattle, is the engineer.

CANADA

ASBESTOS, ONT.—Johns Manville Co. Ltd., Toronto, plans enlarging its manufacturing plant and extending its mining operations here at a cost of over $100,000.

GALT, ONT.—Galt Art Metal Co. is having plans prepared by E. A. Jones, architect, 125 King St. W., Kitchener, Ont., for plant addition to cost about $100,000.

ISLINGTON, ONT.—Vanderville Products Ltd plans a $300,000 plant for manufacturing automotive parts.

TORONTO, ONT.—Prest-O-Lite Battery Co. Ltd., 1352 Dufferin St., is having plans prepared by Hanks & Irwin, architects, 35 Old Mill Rd., for plant addition to cost about $50,000.

TORONTO, ONT.—Brunswick-Balke Collendar Co. of Canada Ltd., 40 Hanna Ave., is receiving tenders through Parrott, Tambling & Witmer, architects, 57 Bloor St. W., for construction of a plant addition to cost about $75,000.

MONTREAL, QUE.—Standard Electric Co., 209 Craig St. W., is planning construction of a plant addition, estimated to cost $100,000. C. Davis Goodman, 1502 St. Catherine St. W., is the architect.

MONTREAL, QUE.—Montreal Locomotive Works Ltd., 215 St. James St. W., is planning construction of a plant addition to cost about $200,000. Sydney Comber & Son, architects, 1502 St. Catherine St. W., are preparing plans.

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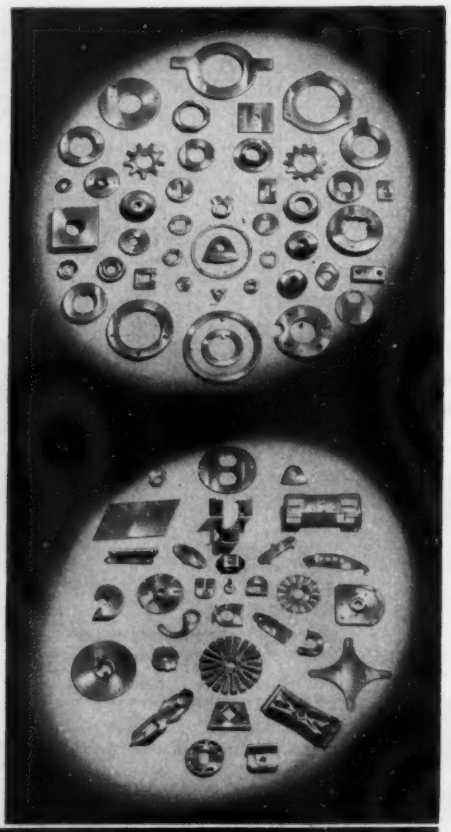

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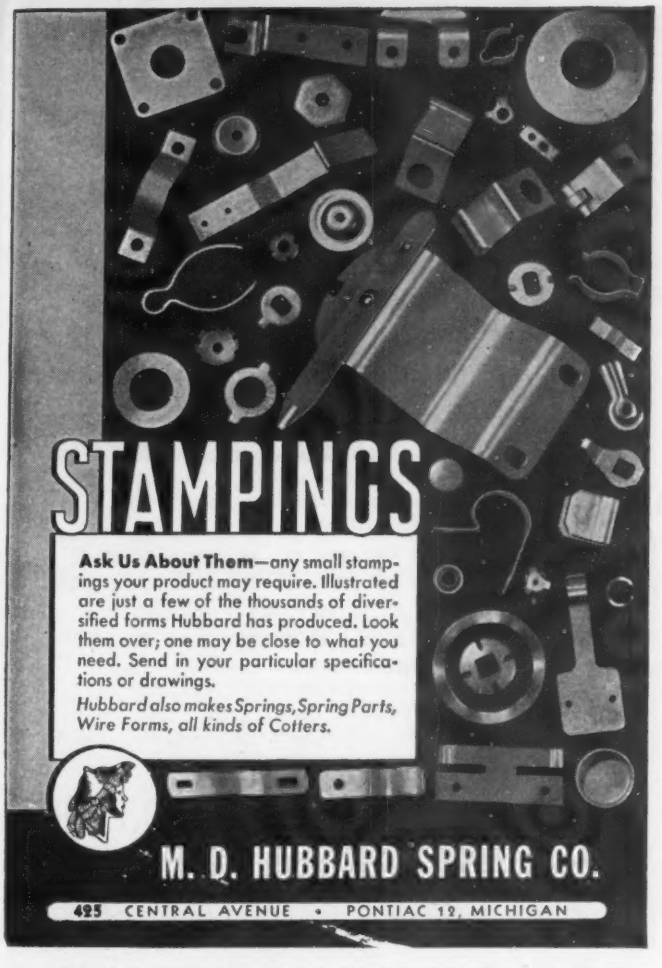

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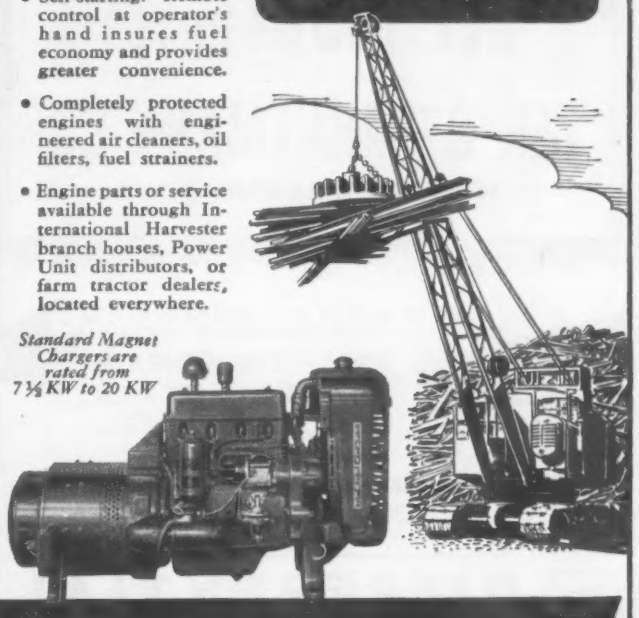

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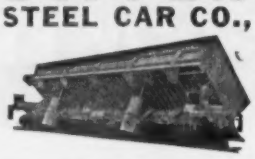
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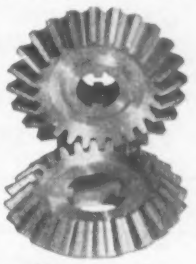

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30-Ton Niles 53'9" Span
30-Ton Reading 56' Span
25-Ton Bedford 50' Span
25-Ton Cleveland 106' Span
25-Ton P&H 70' Span
25-Ton Whiting 106' Span
25-Ton Whiting 82' Span
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20-Ton Morgan 77' Span
20-Ton Northern 60' Span
20-Ton P&H 51'4" Span
20-Ton P&H 39'6" Span
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15-Ton Cleveland 35' Span
15-Ton Morgan 77' Span
15-Ton Niles 32' Span
15-Ton Northern 53' Span
15-Ton Shaw 82' Span
15-Ton Shaw 77' Span
15-Ton Toledo 82' Span
15-Ton Whiting 74'6½" Span
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10-Ton Alliance 58'9" Span
10-Ton "American" 27' Span
10-Ton Case 31'9" Span
10-Ton Cleveland 38' Span
10-Ton Cleveland 50' Span
10-Ton Lane 50' Span
10-Ton Morgan 39'8" Span
10-Ton Morgan 77' Span
10-Ton P&H 57' Span
10-Ton Northern 34' Span
10-Ton P&H 37'4" Span
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5-Ton Milwaukee 66'9" Span
5-Ton Milwaukee 70' Span
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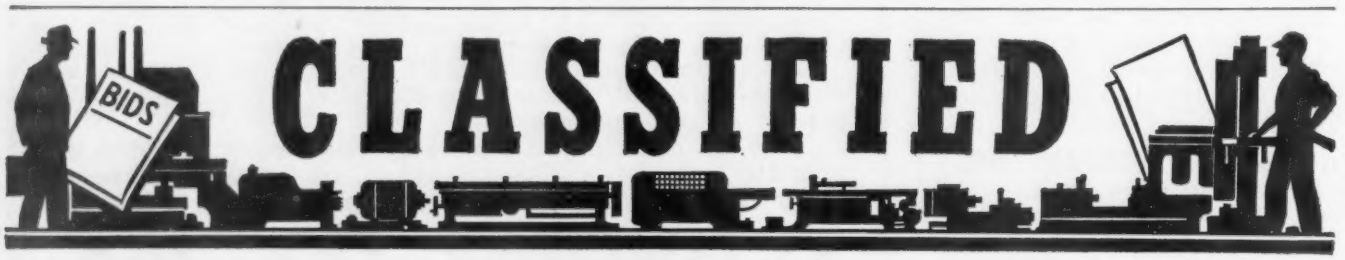

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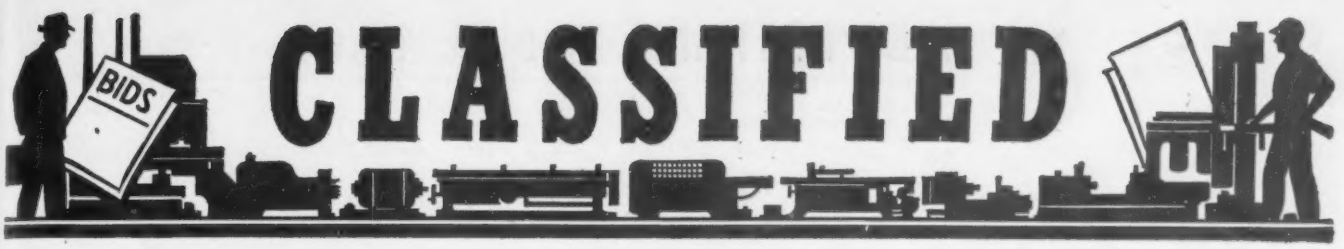

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SHEET METAL WORK
to 1/4" thick
LIGHT IRON WORK
to 3/8" thick
Prompt Delivery
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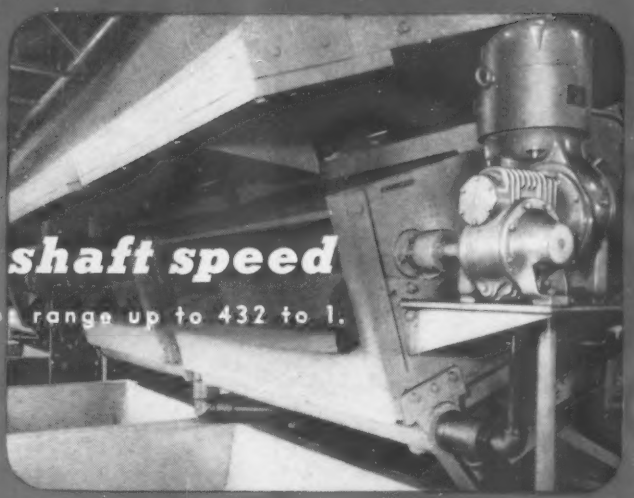

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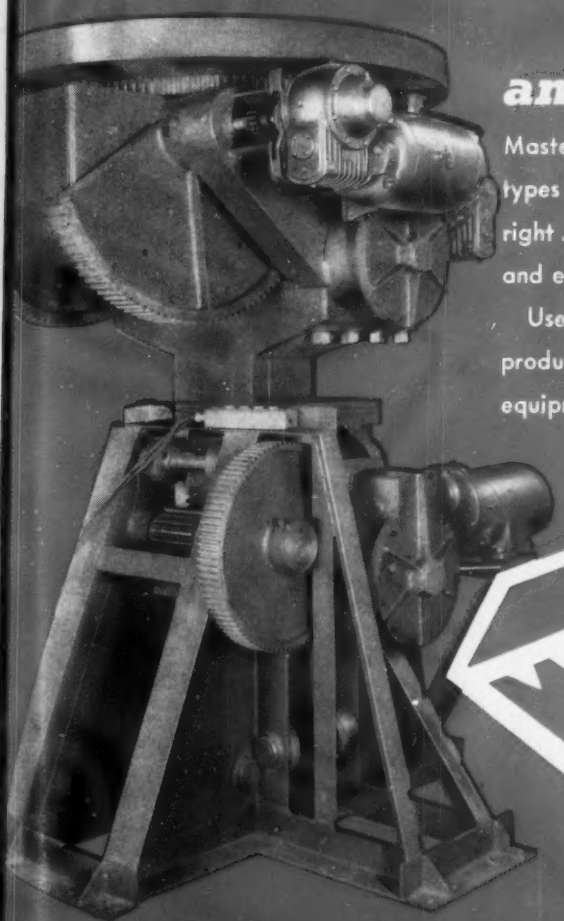

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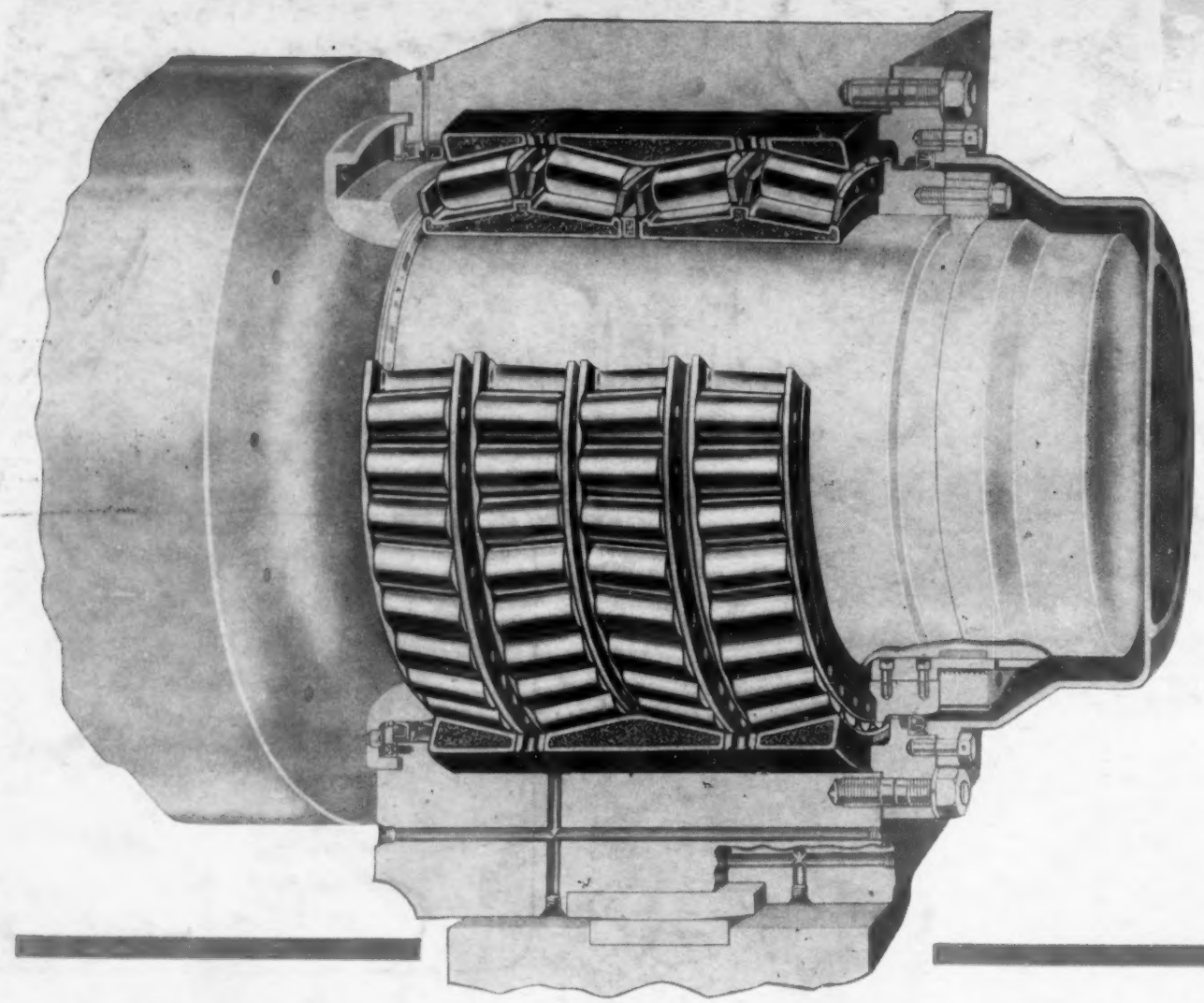

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